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bulletin

NEWS AND VIEWS IN THE BIOLOGICAL SCIENCES

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Raymund L. Zweber

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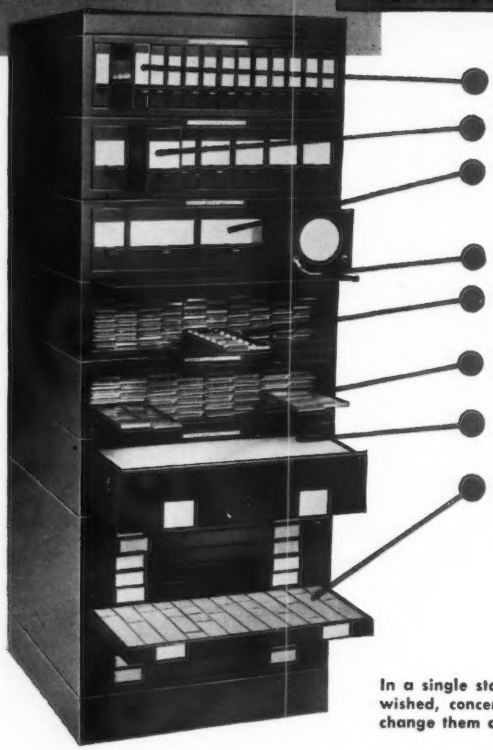

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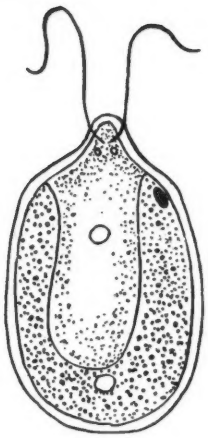

No Esther Williams, but . . .

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[1] One scientist was heard to comment, after meeting Miss Williams, that in his opinion evolution had progressed just about far enough. Dr. Dodson completely ignores this incident in his chapter on Retrospect and Prospect (Man and the Future).

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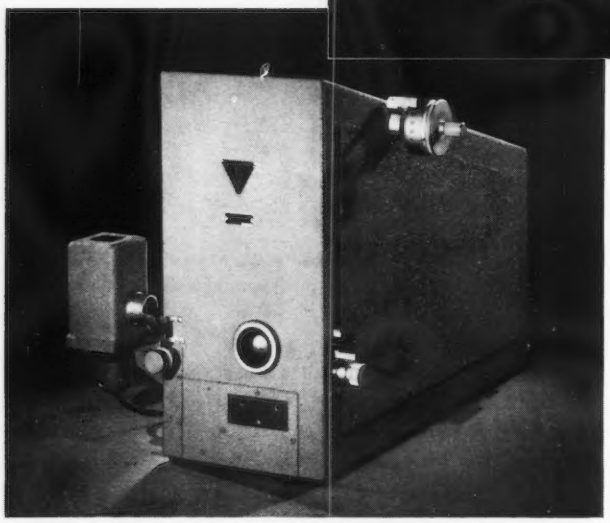

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Editor-in-Chief, ERIC G. BALL, *Harvard University Medical School* *1952. 109 pages. $3.00.*

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By R. D. PRESTON, *University of Leeds* *1952. In press.*

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Across the EDITOR'S DESK

The first issue of the new journal of the Society of American Bacteriologists, **Applied Microbiology,** is expected to appear shortly after the 1st of January, 1953. Dr. H. Boyd Woodruff, at present Assistant Director of the Microbiological Division, Research and Development Laboratories, Merck and Company, Rahway, New Jersey, has been named Editor-in-Chief.

❖

Recent appointments at the National Science Foundation are of interest to biologists. Dr. Fernandus Payne, of the University of Indiana, has been appointed Director of the Division of Biological and Medical Science; Dr. Louis Levin, of the Office of Naval Research, has been appointed Program Chairman for Regulatory Biology; and Dr. Frank H. Johnson, of Princeton University, has been named Director for Developmental Biology.

❖

Dr. Frans Verdoorn, Editor of Chronica Botanica and Chairman of the International Phytohistorical Commission, Waltham, Mass., has been elected a Corresponding Member of the Royal Netherlands Academy of Sciences of Amsterdam.

❖

The Annual Report of the Chairman of the Division of Biology and Agriculture of the National Research Council, Dr. Paul Weiss, covering the period from July 1, 1951 to June 30, 1952, contains items of interest to biologists generally:

(1) In order to place the activities of the Agricultural Board on a more secure and permanent foundation, an Agricultural Research Institute has been created. The membership of this organization consists of industries, trade organizations and non-profit institutions engaged in the development and utilization of agricultural produce, products, and implements.

(2) In an effort to bring the plant sciences abreast with the animal sciences in regard to the scientific aspects of agriculture, and prompted by the urgent need for securing the food supply of the country during any possible emergency, a Committee on Plant and Crop Ecology has been set up under the Chairmanship of Dr. R. E. Cleland and with Dr. Everett F. Davis as Executive Secretary. This Committee, with the aid of several subcommittees, is surveying the problems and needs in the broad area of plant growth in their relations to heredity, soil, climate, disease, and other factors affecting yield.

(3) In contrast to ionizing radiations, the various aspects of radiations at and near the visible spectrum have not received joint consideration. Therefore, a new committee on Photobiology has been appointed to bring together the main areas concerned, including such diverse lines as ultraviolet and infrared spectroscopy, physiology of vision, ultraviolet induction of cancer and mutations, photosynthesis, etc. This Committee will also act as the American Section of the International Commission on Photobiology. Symposia and surveys are foremost on its list of activities.

(4) In order to produce higher standards of research and to satisfy the growing demands for adequate supplies of animals for biological, medical and agricultural investigations and tests, the Division has established a Committee on Animal Resources which will help in devising systematic procedures for the breeding, rearing, certifying, registering and supplying of the needed materials. As in other projects, the long-term interests of scientific research are being taken into account as much as the possible needs that might arise in a national emergency and equal consideration is being given to the needs of laboratories of academic institutions, industry and government.

❖

The summer **Tissue Culture program** of the **Mount Desert Biological Laboratory,** Salisbury Cover, Maine has just completed a very successful season, under the divisional direction of Dr. Philip R. White of the Jackson Memorial Laboratory at Bar Harbor. Participants were: Dr. Betty Danes, Research Fellow, University of Iowa School of Medicine, (physiology of amphibian pulmonary epithelium *in vitro*); Dr. Margaret H. D. Smith, Associate Professor of Pediatrics, Tulane University School of Medicine, (pathological interrelations of bacteria of the Klebsiella-Erwinia groups *in vitro* and *in vivo*); Dr. John Torrey, Associate Professor of Botany, University of California, (limits of divisibility of excised pea roots, as influenced by nutritional factors); and Dr. Frederick Wolfgram, California Institute of Technology, now Research Fellow, Johns Hopkins School of Hygiene and Public Health, (general tissue culture techniques applicable to neurological problems). Miss Barbara Holmes served as assistant to Dr. Smith. The laboratory work was supplemented by group conferences and by a series of six lectures by Dr. White. The program will be continued next year and a general announcement will be released later. Applications should be sent to Dr. White before March 15, 1953.

❖

Dr. Carl C. Lindegren, Director of the Biological Research Laboratory of Southern Illinois University announces the completion of a sound movie entitled **The Life Cycle of a Yeast Cell.** This motion picture is about 600 feet long and takes about 12 minutes. The film shows the microforge making microtools, dissection of a 4-spored ascus, budding and hybridization by time lapse photography and commercial production of yeast. This film can be rented at $2.65 by writing to the Audio-Visual Aids Service, Southern Illinois University, Carbondale, Illinois.

❖

Dr. Warren B. Mack, Professor of Horticulture and Head of the Department of Horticulture at the Pennsylvania State College died in Philadelphia, July 6, 1952 of a coronary occlusion. A distinguished horticulturist and plant physiologist, Dr. Mack served as president of the American Society for Horticultural Science from 1944-46, and as one of the directors of the American Horticultural Council. For nearly 30 years his work and activities exerted a profound and lasting influence on horticultural practices and production.

❖

Students and the Armed Services, a source book of information about the armed forces for the students, teachers, counselors, and administrators of the nation's secondary schools and colleges, has recently been published by the Department of Defense. Chapters discuss Selective Service Procedures; Enlistment Procedures; Personnel Procedures; Occupation Training Opportunities; Educational Opportunities . . . as Part of Occupational Training; Educational Opportunities . . . Voluntary, Off-duty Study Programs; Opportunities for Officer

Commissions; Academic Credit for Service Experiences; Religious and Moral Guidance Programs; Recreational and Welfare Programs; Conclusions; Bibliography. This publication is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. The price is 45 cents.

❖

The Committee on Developmental Biology (Paul Weiss, Chairman; T. C. Byerly, J. W. Foster, W. W. Greulich, K. V. Thimann and B. H. Willier) of the Division of Biology and Agriculture, operating under a two-year grant of $25,000 from the Rockefeller Foundation, has concluded its first year of activity designed to further the study of development and growth. In a number of meetings concerned with the subject matter of the Committee, priority has been given to the following matters: (1) conferences and hearings on underdeveloped and inadequately correlated fields; (2) a study of educational problems in development biology.

On June 26-29, 1952, the Committee co-sponsored and gave partial financial support to the annual symposium of the Society for the Study of Growth and Development at Williamstown, Massachusetts, on the "Dynamics of Growth Processes." For a critical examination of the adequacy and consistency of current concepts in developmental biology, the Committee arranged a conference on "Concepts and Terms" which was held May 3-6 at Arden House, New York. The Committee has also been instrumental in securing strong American representation at international conferences, one at Utrecht, Holland, August 27-29, 1952 and the other at Stockholm, Sweden, September 2-6, 1952. The conference at Utrecht on "The Biochemical and Structural Basis of Morphogenesis" was held in conjunction with the triennial meeting of the International Institute of Embryology. The Stockholm conference on "The Cellular Basis of Differentiation" was sponsored by the International Society of Cell Biology. Other conferences are planned for the future on "Problems of Specificity in Development"; "Biology of Insects"; and "Cell Division and Morphogenesis." The Committee participated in a conference on "Tissue Transplantation" arranged by the Morphology and Genetics Study Section of the Division of Research Grants of the National Institutes of Health on October 7-8 at Arden House, New York. The Committee cooperates closely with the Growth Society and is assisting in the arrangements for a forthcoming Oak Ridge Symposium on "The Effects of Radiation and Development."

The Committee has instituted a new technique of consultative services which provides an effective means of intercommunication among working scientists. Twenty-four investigators in areas concerned with developmental biology in various institutions across the country have been appointed "correspondents" and have assumed the responsibility of collecting local and regional information, reporting on trends, developments and needs, communicating suggestions, and in turn, acting as liaison agents between the respective institutions. With the aid of this team, a survey of educational facilities in developmental biology, including medical and agricultural training, has been undertaken as a basis for later recommendations. George W. Nace, on leave from Duke University, has accepted an appointment as Staff Assistant to the Committee and to the Division and will be available to expedite the work of the Committee.

❖

A **Conference on the *Cellular Basis of Differentiation*** was held in the lecture hall of the Wenner-Grens Institute in Stockholm, Sweden, from September 2 to September 6, 1952. The conference was sponsored by the International Union of Biological Sciences and was arranged under the auspices of the International Society for Cell Biology.

The program was unique in the sense that it contained no formal papers, but was dedicated to informal, spontaneous discussions of topics announced to the participants in advance. The Tuesday sessions which were under the leadership of Professor M. W. Woerdeman, of Amsterdam, the Netherlands, and Dr. A. E. Mirsky of New York dealt with the topic of mechanism of cytodifferentiation. The sessions of Wednesday were led by Professor E. Hadorn of Zurich, Switzerland, and Professor V. C. Twitty of Stanford University, and treated the subject of intercellular relations in differentiation. The humoral milieu of cytodifferentiation was the subject of Friday's discussions which were under the chairmanship of Professor B. H. Willier of Johns Hopkins University and Dr. Honor B. Fell of Cambridge University, England. Saturday was devoted, primarily, to a summary of the week's achievements by Professor Paul Weiss, University of Chicago.

An ample opportunity was afforded the guests to visit the laboratories at Karolinska Institute and the Wenner-Grens Institute. Among the most significant demonstrations were probably the ultra-violet microspectroscopy of Professor Torbjörn Casperson at the Karolinska Institute and a device for computing automatically cell samples separated by chromotography. The latter device was conceived by Decent O. Lindberg and is essentially a radiation counter which makes records of cells tagged with isotopic atoms.

The conference was favorably commented upon in the Swedish press, both from a standpoint of the people present at the conference and from the standpoint of contributions made to the discussions.

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The **White Mountain Research Station** on Mount Barcroft, California, in the White Mountain range near the California-Nevada border, is expected to become one of the leading high altitude research laboratories on the North American continent under a program of joint support by the National Science Foundation, the Office of Naval Research and the Rockefeller Foundation. The three agencies have obligated themselves to provide combined support totaling $36,000 per year for a three-year period.

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The Second Graduate Fellowship Program of the National Science Foundation, providing awards for study during the 1953-54 academic year in the mathematical, physical, medical, biological and engineering sciences is announced. During the current—1952-1953—academic year nearly 600 NSF Fellows will receive advanced training in science under this program. The majority of awards under the 1953-54 program will be made to graduate students seeking master's or doctor's degrees in science, although a limited number of awards will be made to postdoctoral graduates.

Candidates will be judged on their scientific aptitude and achievement as reflected in academic records and recommendations from individuals who are familiar with their scientific aptitude. Predoctoral applicants will take an examination designed to measure scientific promise and level of advancement. Applicants will be screened by panels of outstanding scientists chosen by the National Academy of Sciences. Final selection will be made by the National Science Foundation. No awards will be made for study in clinical medicine, although awards will be made to medical students interested in careers in medical research.

Application forms for both predoctoral and postdoctoral graduate fellowships for the 1953-54 academic year may be obtained after October 1, 1952, from the National Science Foundation, Washington 25, D.C. Completed applications must be returned to the Fellowship Office, National Research Coun-

cil, by January 5, 1953. The special examination for predoctoral candidates will be given at various places throughout the United States on January 31, 1953.

NSF graduate Fellows may attend any accredited non-profit institutions of higher education in the United States or similar institutions abroad.

Stipends for NSF graduate fellowships will vary with the academic status of the Fellows. First year Fellows—students entering graduate school for the first time or those who have had less than one year of graduate study—will receive a stipend of $1,400. Fellows who need one final academic year of training for the doctor's degree will receive a stipend of $1,800. Fellows between these groups will receive a stipend of $1,600. The basic stipend for postdoctoral Fellows will be $3,400 per year. Dependency allowances will be made to all married Fellows. Tuition and laboratory fees and limited travel allowances will also be provided.

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A symposium on **Photosynthesis** will be held at Gatlinburg, Tennessee, on October 29, 30, 31, and November 1. The meeting will be supported jointly by the National Science Foundation, Atomic Energy Commission, and Office of Naval Research through the Committee on Photobiology of the National Research Council which is operating to organize but not to direct the symposium. The symposium is for free discussion by investigators actively engaged in this field and is not to consist of formal papers. The following areas of research on photosynthesis will serve as the basis for the discussions: molecular structure of chlorophyll and related pigments; questions of photochemistry; molecular spectra of chlorophyll; fluorescence; transfer of excitation energy between various molecules; transfer of electronic excitation to free energy; maximum efficiency; quantum requirements; oxidation-reduction; Hill reaction; organization of the plastid from the point of view of reactions; the path of carbon during its photosynthetic assimilation; biochemical energy transfer in photosynthesis; characteristics of the biochemical reducing pool.

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A second **Conference on Scientific Manpower** will be held at the AAAS meeting in St. Louis on December 27-29. The Conference will be sponsored by Section M, Engineering, of the AAAS; the Engineering Manpower Commission; and the Association's Cooperative Committee on the Teaching of Science and Mathematics. Speakers will include: Dael Wolfe, Director, Commission on Human Resources and Advanced Training; E. G. Williamson, Dean of Students, University of Minnesota; C. W. De Kiewiet, President, University of Rochester; Bowen C. Dees, Chief, Fellowship Section, Division of Scientific Personnel and Education; Warren Johnson and Philip N. Powers, Consultants to the Division of Scientific Personnel and Education; and Melvin J. Maas, Major General, U. S. Marine Corps Reserve, Ret'd.

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The **14th International Congress of Zoology** is to be held in Copenhagen, Denmark, from August 5-12, 1953. Dr. R. Spärck is President of the Congress; Dr. Anton Fr. Bruun has been appointed Secretary General. The preliminary plan is to have three General Meetings for all members while the Congress will be divided into sections for the consideration of special topics. Two excursions to West- and East-Jutland have been planned after the Congress with perhaps a third trip to study marine fauna of the deeper part of the Skagerrak. No excursions are planned to precede the Congress. Membership fee for the Congress will be fifteen dollars.

From the SOCIETIES

• The **Fourth Annual Midwestern Conference of Parasitologists** was held June 16-17 on the Urbana campus of the University of Illinois. A total of 93 registrants attended the two-day meeting, at which 24 demonstrations of research-in-progress were presented. At the annual banquet, Dr. A. C. Walton of Knox College gave an informal, illustrated talk on a recent trip through South America.

One of the highlights of the conference was a panel discussion on ***Selected Problems in the Teaching of Parasitology.*** The following topics were introduced by the panelists as background for general discussion:

Dr. L. O. Nolf (Iowa), Ecological Interrelationships of Hosts and Parasites.

Dr. C. A. Herrick (Wisconsin), Adaptation for Nutrition of Parasites.

Dr. E. R. Becker (Iowa State), Adaptations for Maintenance of Parasites in their Hosts.

Dr. W. Lindquist (Michigan State), Acquired Immunity.

Officers elected for the coming year are Dr. Chester A. Herrick, Presiding Officer, and Dr. William Balamuth, Secretary-Treasurer. Any interested individuals may be added to the mailing list by communicating with the Secretary-Treasurer at the Department of Biological Sciences, Northwestern University, Evanston, Ill.

• The **Society for Industrial Microbiology** will meet with Section "P" of the A. A. A. S. in St. Louis, December 26-31, 1952. The Society is sponsoring a symposium on the general subject of *Industrial Microbiology*. A program of contributed papers is contemplated. An effort will be made at the St. Louis meeting to organize a Midwestern section of the Society. Committee in charge of the program:

Chairman: Dr. John S. Karling, Purdue University.

Antibiotics Section: Dr. Ralph E. Bennett, Commercial Solvents.

Deterioration Section: Dr. John W. Appling, Buckman Laboratories.

Fermentation Section: Dr. J. E. McClary, Anheuser Busch.

General Section: Dr. M. M. Baldwin, Battelle Memorial Institute.

• Copies of the **Glacial Border Symposium** are available and are being distributed at cost. They may be had by writing to Murray F. Buell, Secretary of the Ecological Society of America, Rutgers University, New Brunswick, N. J. Please enclose 40¢ in stamps. This symposium includes the following: Vegetation and cryoplanation by H. M. Raup; Pleistocene frost action near the border of the Wisconsin drift in Pennsylvania by C. S. Denny; The fossil record near the glacial border by J. E. Potzger; The possible role of microclimate by John N. Wolfe; Distribution of Ohio animals by Edward S. Thomas; Plant distribution in relation to the glacial boundary by E. Lucy Braun.

• An attendance of 1,000 foresters from the United States and Canada is expected at the joint meeting of the **Society of American Foresters** and the **Canadian Institute of Fores-**

try to be held in the Mount Royal Hotel, Montreal, November 17-20. Centered around the theme "Trends in North American Forestry," the program will have 100 speakers and will feature two general sessions and seven technical sessions. The technical sessions are for foresters with specialized interests in the fields of professional forestry education, silviculture, forest management, forest utilization, forest economics and taxation, forest recreation, wildlife and range management, and public relations. Several U. S. and Canadian foresters who have made outstanding contributions to the advancement of forestry will be honored at the joint dinner of the two societies on November 19.

• The **Ninth International Genetics Congress** meets in Bellagio, Italy August 24-31, 1953. Dr. Richard Goldschmidt is President of the Congress. A travel committee (F. J. Ryan, chairman) is making arrangements for travel and soliciting financial aid to help defray the expenses of members attending the Congress. A letter has been sent to all geneticists who signified their intention of attending. If anyone failed to receive this letter please contact Dr. F. J. Ryan, Zoology Department, Columbia University, New York 27, N. Y.

The A·I·B·Scope

• The **Advisory Committee on Hydrobiology** announces that the *Directory to Hydrobiological Laboratories and Personnel in North America* will soon go to press. Directors of hydrobiological laboratories and hydrobiologists who haven't returned their questionnaires are urged to do so immediately. Directors of laboratories and hydrobiologists who may not have received questionnaires should write for same immediately to Dr. Robert W. Hiatt, University of Hawaii. The committee hopes to make this Directory as useful as possible by having it complete and up to date. *Please send the questionnaires back at once.*

• The **Advisory Committee on Physiology** to the Office of Naval Research met in New Orleans, La. on September 2nd and reviewed about twenty proposals and a number of currently sponsored projects. Dr. Ralph Gerard is chairman of this committee.

• The **Advisory Committee on Biology** to the Office of Naval Research met in Ithaca, N. Y. on September 11th under the chairmanship of Dr. Max Kleiber. At that time approximately twenty-five proposals were evaluated on their scientific merit.

• The **Editorial Board of the *AIBS Bulletin*** met in Ithaca, N. Y. on September 9th. The general aspects of editorial policy were discussed and long range plans for the *Bulletin* were made. Present at the meeting were H. B. Steinbach, Chairman of the Editorial Board; Ralph E. Cleland; C. J. Hylander; T. C. Byerly, Chairman of the Governing Board; Ileen E. Stewart, Managing Editor of the *Bulletin;* and S. L. Meyer, Editor of the *Bulletin.*

• The **Governing Board of the AIBS** held a luncheon meeting in the Faculty Lounge at Statler Hall on the Cornell campus on Monday, September 8th. The presidents of all the societies meeting at Ithaca, or their appointed alternates, were the invited guests of the Governing Board. Dr. T. C. Byerly, Chairman of the Board, presided and called the attention of the group to the following items: (1) the role of the AIBS in assisting the American Physiological Society in its study of physiology as a science by compiling information on high school and elementary school textbooks in biology and related areas; (2) the probable relation of the AIBS to a committee on Animal Resources which has been established by the Division of Biology and Agriculture of the National Research Council; (3) the prospects for continued financial support for the Handbook of Biological Data; (4) the proposed representation of the AIBS on the U. S. National Commission for UNESCO; and (5) the organizations known to be considering membership, affiliate, or associate status. The Board approved of AIBS participation in the organization of the proposed Scientific Manpower Commission and the Chairman appointed Dr. F. P. Cullinan and Dr. S. L. Meyer as the representatives of the AIBS authorized to take part in the establishment of the Commission.

The BIOLOGY LIBRARY

One copy of each publication submitted for listing should be sent to the Editor, The AIBS Bulletin, 2101 Constitution Avenue, Washington, D. C.

Advanced Statistical Methods in Biometric Research. C. RADHAKRISHNA RAO. 390 pages. John Wiley & Sons, Inc. 440 Fourth Avenue, New York 16, N. Y. (1952) $7.50.

Dr. Rao is Professor of Statistics at the Indian Statistical Institute in Calcutta. This book, one of the Wiley Publications in Statistics, represents a delicately balanced treatment of the theory of multivariate analysis and its applications. Though most of the examples are from the field of biometric research, where the author has had extensive experience, the methods and formulae are applicable in many other fields where statistics plays a role.

Background of Human Fertility in Puerto Rico. PAUL K. HATT. 512 pages. Princeton University Press, Princeton, N. J. (1952). $5.00.

This survey was prepared under the joint sponsorship of the Social Science Research Center of the University of Puerto Rico and the Office of Population Research of Princeton University. The goal of the project was to secure as much information as possible about the basic attitude patterns and life conditions which affect fertility levels in Puerto Rico. The book has been issued in a paper-bound edition with the text material liberally expanded by tables.

Biochemical Preparations. (Volume II). E. G. BALL, editor. 109 pages. John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. (1952). $3.00.

The preparation of twenty-three additional compounds is described in the second volume of this series.

Biochemical Studies of Bacterial Viruses. E. A. EVANS, Jr. 68 pages. The University of Chicago Press, 5750 Ellis Avenue, Chicago 27, Illinois. (1952). $2.75.

This book is an appraisal of the current status of biochemical research in the field of bacterial viruses. It represents in great part a discussion of the results of important investigations carried out in the laboratories at the University of Chicago where the author is Professor and Chairman of the Department of Biochemistry. The material is presented under three headings: (1) the nature of the virus particle, (2) the origin of viral components, and (3) the mechanism of virus reproduction.

Biology: Its Human Implications. (2nd edition). GARRETT HARDIN. 732 pages, illustrated. W. H. Freeman and Company, 549 Market Street, San Francisco 5, California. (1952). $5.00.

"What should a student learn in a college course in biology if he will never again be exposed to formal instruction in the subject?" This question, posed by the author in the preface to his first edition, has continued to be his primary guide in the revision. Again general principles and human implications are stressed. The greatest changes have been made in Part III, Heredity, in which the discussion has been expanded with emphasis on human problems, and in Part IV, Evolution and the Living World, in which the systematic treatment of plants and animals is preceded by an extended discussion of the concept of evolution. More material has been devoted to microbes and their activities. In all parts of the book, historical examples are used to illustrate the scientific method in action.

Chemical Physiology of Endoparasitic Animals. THEODOR VON BRAND. 339 pages, charts. Academic Press, Inc., 125 East 23rd Street, New York 10, N. Y. (1952). $7.50.

The physiology of parasites is a relatively recent area of investigation and, until the appearance of this text, few, if any, reviews of the literature were available. The author, who has devoted years to research in this field, believes that one of the difficulties in training prospective parasitologists in the physiological aspects, or of focusing the interest of the biochemist on parasitological problems, has been the lack of an adequate review of past research. The present book should fill this gap. It is written at the graduate student level and quotes literature extensively for the benefit of investigators interested in any particular phase of parasite physiology.

Deformation and Flow in Biological Systems. A. FREY-WYSSLING. 552 pages. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. (1952). $11.50.

A distinguished Swiss physiologist, Dr. Frey-Wyssling reviews in this monograph, the present rheological problems in animal and plant physiology. In biology, rheological problems are treated either by a simple description of observed facts or through attempts at theoretical considerations which generally lead to very complicated mathematical formulations. The various types of rheological phenomena in living systems, such as flow, convection, elasticity, plastic deformation, contraction and even growth, are within the scope of this text. Since the first International Colloquium on Rheological Problems in Biology was held in Sweden at the time this book was being written, extensive reports from this Conference have been incorporated.

General Genetics. ADRIAN M. SRB and RAY D. OWEN. 571 pages, 182 illustrations. W. H. Freeman and Company, 549 Market Street, San Francisco 5, California. (1952). $5.50.

This book is a sound and comprehensive text for an introductory course in genetics. The subject is presented without the usual systematic historical approach but rather with the general biological implications of genetics in mind. As one of the great experimental sciences of this era, the authors believe genetics should be viewed as a series of problems and challenges, some of which have been successfully met and supplanted by others. To aid with the "problem-solving" aspect, the authors have included questions and problems which will confront the student with actual experimental situations for his interpretation. A number of new illustrations add considerably to the general appearance of the text.

A Guide to the History of Science. GEORGE SARTON. 316 pages. Chronica Botanica Company, Waltham, Massachusetts and Stechert-Hafner, Inc., New York City, N. Y. (1952). $7.50.

Dr. Sarton, dean of American scientific historians, has combined in this volume two quite separate contributions. The first part of the book is in the form of three lectures delivered at the Universities of London, Paris, Liege and Geneva in 1948, and explains the purpose and meaning of the history of science. This section is meant to be read and enjoyed by scientists and scholars alike. The second section is a bibliographic summary of the history of science, giving the means of implementing the present knowledge of scholars interested in pursuing further the historical development of the sciences.

Human Locomotion and Body Form. DUDLEY J. MORTON. 297 pages, illustrated. The Williams & Wilkins Company, Baltimore 2, Maryland. (1952). $5.00.

The primary purpose of this book is to coordinate the different organic factors operating within the body with the major aspects of mechanical action in order to portray their combined roles in the interaction with gravity as an outside mechanical force. This unique fortification of bio-mechanics by engineering promotes an understanding of the true physiological nature of locomotion.

A Hundred Years of Biology. BEN DAWES. 429 pages, 25 diagrams. The Macmillan Company, 60 Fifth Avenue, New York 11, N. Y. (1952). $5.00.

"The general science of biology covers not less than twenty-five different specialist studies . . . only an author with exceptional clarity of vision and exceptionally wide experience could undertake a survey of this kind, which follows the work of pioneers in all these spheres from the time of Linnaeus and Lamarck down to the present day." Dr. Dawes, scientist at the University of London, devotes space as well to the special applications of biology in the marine, agricultural and medical spheres and describes the latest technical advances in microscopy and cinematography.

Journals of Research. CHARLES DARWIN. 615 pages, 17 plates. Hafner Publishing Company, 31 East 10th Street, New York 3, N. Y. (1952). $7.50.

The Hafner Publishing Company offers in this volume a facsimile reprint of the now-rare first edition (1839) of Darwin's Journal, kept during his five-year voyage around the world on H.M.S. *Beagle*. Darwin was only twenty-five when he returned to England, in 1836, from this voyage and his notes reveal much about his intellectual development and change in outlook en route. His reports should be of considerable interest to geologists and historians as well as biologists, for Darwin faithfully recorded the geological structure of each area where the *Beagle* stopped and much of the country inland from the coast, as well as describing in detail the inhabitants, native and emigrant, their social life and customs and the political and economic standards of each country visited.

Laboratory Anatomy of the Fetal Pig. THERON O. ODLAUG. 42 pages. Wm. C. Brown Company, 915 Main Street, Dubuque, Iowa. (1951). $1.50.

Part of a Laboratory Anatomy Series, this guide adequately illustrates one of the common laboratory animals, the fetal pig.

Laboratory Manual for Elementary Human Physiology. THERON O. ODLAUG. 34 pages. Wm. C. Brown Company, 915 Main Street, Dubuque, Iowa. (1952).

This laboratory manual was designed to use two experimental animals, the frog and the student, and by means of simple experiments introduce the basic phenomena concerned with the functioning of the human body.

Laboratory Manual for Introductory Zoology. C. C. ZELIFF. 154 pages. The Evangelical Press, Harrisburg, Pa. (1948).

The directions in this manual are planned for an introductory course in zoology of two semesters and three to six hours of laboratory time each week.

Microbiology of Water and Sewage. P. L. GAINEY and T. H. LORD. 430 pages, illustrated. Prentice-Hall, Inc., 70 Fifth Avenue, New York 11, N. Y. (1952). $5.90.

The two authors, both members of the Bacteriology Department of Kansas State College, have gathered the factual content from the literature in the field and assembled it into a text intended for a special course on the microbiology of water and sewage. As the first six chapters deal with microbiology in general, someone without a formal course in bacteriology could use the book.

The Nature and Properties of Soils. T. L. LYON, H. O. BUCKMAN and N. C. BRADY. 591 pages, illustrated. The Macmillan Company, 60 Fifth Avenue, New York 11, N. Y. (Fifth edition, 1952). $5.75.

The authors of this college text of edaphology have attempted, in writing the fifth edition, to digest and evaluate the flood of new information that has inundated the field in the last decade and to incorporate it in a form even simpler than that of the preceding edition. To attain this objective all but five of the original chapters have been entirely revised or rewritten. As a further aid to clarity as well as to interest, the number of illustrations has been more than doubled.

A New Manual for the Biology Laboratory. B. R. WEIMER and E. L. CORE. 333 pages. John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. (Second edition, 1952). $3.50.

A paper-bound, large-size manual, the pages are marginally perforated as well as loose-leafed. Considerable space is left in the text for original drawings by the student as he dissects in the laboratory or observes microscope slides. The material offered corresponds to that studied in the average introductory course in general biology.

Paper Chromatography. A Laboratory Manual. RICHARD J. BLOCK, R. LESTRANGE and G. ZWEIG. 195 pages, illustrated. Academic Press, Inc., 125 East 23rd Street, New York 10, N. Y. (1952). $4.50.

Paper chromatography as a biochemical tool has become increasingly popular during the last ten years. This monograph, by three biochemists associated with the Borden Company Laboratories, is a practical manual of procedures. The book covers the many uses and adaptations of paper chromatography and contains chapters on the following substances: amino acids, amines, proteins, carbohydrates, aliphatic acids, steroids, purines, pyramidines, phenols, aromatic acids, porphyrins, antibiotics and vitamins, as well as many miscellaneous organic and inorganic substances.

Plants, Man and Life. EDGAR ANDERSON. 245 pages, 16 illustrations. Little, Brown & Company, 34 Beacon Street, Boston 6, Mass. (1952). $4.00.

The author of this fascinating little book is Assistant Director of the Missouri Botanical Garden and Professor of Botany at Washington University, St. Louis. In it, he has provided both the general reader and his fellow scientists with a new and vivid insight into the green world about us. The book is truly, as Dr. Anderson himself describes it, "a set of related detective stories in which suggestive pieces of evidence are brought in and analyzed but in which the final chapter finds us still running down likely clues, far enough along in our quest to describe the villain but not as yet able to point him out by name."

Problems of Life. An Evaluation of Modern Biological Thought. LUDWIG VON BERTALANFFY. 216 pages. John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. (1952). $4.00.

For more than twenty years the author has been advocating a biological viewpoint known as the *organismic conception.* This book is based on the author's own work, theoretical and practical; at the same time it gives a survey of results, scattered in various publications, that appear significant in terms of this theory. Dr. Bertalanffy believes that "the right to speak of a biological world-view follows from the central position occupied by biology in the hierarchy of the sciences. Because of this central position among the sciences, biology has possibly the greatest multiplicity of problems: the phenomenon of "life" is a meeting place for those conceptions which, according to the usual distinction, originate in the exact sciences on the one hand and in the social sciences on the other."

Profitable Poultry Management. CLARENCE E. LEE. 284 pages, illustrated. The Beacon Milling Company, Inc., Cayuga, N. Y. (20th edition, 1952).

This is a well-indexed handbook which will prove to be a helpful reference for poultry producers. The author is Vice-president and Director of Poultry, Game Bird and Small Animal Research of the Beacon Milling Company.

Readings in Biological Science. Edited by IRVING W. KNOBLOCH. 465 pages. Appleton-Century-Crofts, Inc., 35 West 32nd Street, New York 1, N. Y. (1948). $3.00.

This book was designed to be read in conjunction with an introductory college course in biology. Excerpts from the writings of men of science since Hippocrates have been woven into a pattern of readings, which begin with the cell and trace the story of life through plants and animals to man. There are several articles of a philosophical nature, added to integrate the various divisions of biological study. A total of 61 articles is included and an adequate bibliography leads interested students to the original and complete works from which the excerpts were chosen.

The Science of Biology. WILLIAM C. BEAVER. 895 pages, 375 text illustrations. C. V. Mosby Company, 3207 Washington Boulevard, St. Louis 3, Mo. (4th edition, 1952). $5.85.

Numerous changes characterize this revision of a text which first appeared in 1939. Material has been rearranged, added and deleted to improve organization and presentation. Pronunciation and the derivation of terms are more extensively considered. Tables are more frequent and the more natural classification of the plant kingdom has been introduced. New illustrations are included and others have been revised. Questions and topics at the end of each chapter provide tools for self-testing and guides for study.

The Science of Zoology. JAMES C. PERRY. 709 pages, 463 figures. The Bruce Publishing Company, Milwaukee 1, Wisconsin. (1952). $6.50.

Dr. Perry, of the Department of Biology at Marquette University, has designed a text which presents the science of zoology as a field of knowledge in its own right rather than as an introduction to the specialized fields of study. It is intended to fulfill the textbook requirements of Liberal Arts colleges. Unification of content is achieved through the use of organization as an integrating theme.

Student's Manual to accompany "The World of Life." WOLFGANG F. PAULI. 65 pages. Houghton-Mifflin Company, 2 Park Street, Boston, Mass. (1952). $1.00.

This, a question manual designed to be used with "The World of Life," was prepared by C. H. Nelson of Michigan State College under the editorship of Bentley Glass. Five pages of selected references are given for the student who would pursue further any special area of biology.

Symmetry. HERMANN WEYL. 168 pages, illustrated. Princeton University Press, Princeton, N. J. (1952). $3.75.

Professor Weyl, of the Institute for Advanced Study at Princeton, is world famous for his contributions to mathematics and the philosophy of science. In this book, which is semi-popular in character, the author shows, on the one hand, the great variety of applications made of the principles of symmetry in the arts, in organic and inorganic nature, and on the other hand, he clarifies, step by step, the philosophical-mathematical significance of the idea of symmetry. An abundance of excellent illustrations highlights the text material.

Symposium on Radiobiology. Edited by JAMES J. NICKSON. 477 pages. John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. (1952). $7.50.

This volume reports the papers and discussions presented at the Oberlin Symposium on Radiobiology, held at Oberlin College, June 14-19, 1950, and sponsored by the Subcommittee on Radiobiology of the Committee on Nuclear Science of the National Research Council, assisted by the Atomic Energy Commission and the Office of Naval Research. The 23 essays deal with four distinct but inter-related phases of radiobiology: (1) a survey of the physical interaction of ionizing radiation and matter; (2) an explanation of the chemical changes arising from the transfer of physical energy; (3) an examination of the biochemical effects; and (4) a discussion of the changes occurring in living tissue.

Ultraviolet Radiation. LEWIS R. KOLLER. 278 pages, illustrated. John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. (1952). $6.50.

Dr. Koller, Research Associate at the General Electric Research Laboratory, Schenectady, New York, has written a book which attempts to answer some of the questions which confront physicists and specialists in fields other than physics when they work in this portion of the spectrum. Its preparation was prompted by inquiries from physicists, biologists, medical men, chemists, engineers, and laymen. In addition to an introduction, there are chapters on arcs, incandescent sources of radiation, solar radiation, transmission, reflection, applications and effects of ultraviolet, and detectors of ultraviolet radiation.

Introductory Mycology. CONSTANTINE JOHN ALEXOPOULOS. 482 pp., illustrated with photographs and drawings. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. (1952). $7.00.

The author of this new textbook in introductory mycology is a Professor of Botany and Plant Pathology at Michigan State College. The purpose of his book is to answer as simply and concisely as possible the question: "What are the fungi and how do they affect us?" The book is written for the student who knows nothing about the fungi and who needs an orderly presentation of certain fundamental facts on their structure and classification without the innumerable details and exceptions which make the study of the fungi so fascinating for the specialist but so bewildering to the beginner. The book is well illustrated with photographs and drawings. The diagrams of life cycles are particularly effective.

Design for a Brain. W. ROSS ASHBY. 260 pp., illustrated with diagrams. John Wiley & Sons, Inc., 440 Fourth Ave., York 16, N. Y. (1952). $6.00.

Design for a Brain attacks an outstanding scientific problem: how can the brain, as a mechanism, also be "intelligent"? Can a mechanism develop a "cleverness" of its own? If so, how? Step by step the author, whose researches on the functioning of the brain have been widely recognized, develops the answer. The discussion first clarifies and relates the various physical and psychological concepts and shows how the problem can be stated with both generality and precision. It then develops the solution: the *principle of ultrastability*. The remainder of the book describes how the principle was built into a mechanism, how the mechanism behaved, and how the result explains the origin of the nervous system's power of being self-organizing and adaptive.

Zinsser's Textbook of Bacteriology. DAVID T. SMITH and NORMAN F. CONANT. 1012 pp., 330 figures. Appleton-Century-Crofts, Inc. 35 West 32nd Street, New York 1, N. Y. (10th edition, 1952). $11.00.

The first edition of this *Textbok of Bacteriology*, written by P. H. Hiss, Jr., and H. Zinsser, appeared in 1910. For more than forty years, it has proved to be of tremendous value to the bacteriologist and to the student of public health and clinical medicine. Every chapter has been extensively revised or rewritten. Information about the susceptibility of each organism to the newer antibiotics has been included. Where available, the information on the favorable and unfavorable effect of ACTH and cortisone on each specific infection has been presented. Changes in typography facilitate reading and 132 new illustrations have been added.

Practical Experiments in General Bacteriology. R. C. HATFIELD. 104 pp. Wm. C. Brown Company, 915 Main St., Dubuque, Iowa. (1952). $2.75.

This manual covers the basic laboratory procedures required in any college course in general bacteriology. In addition, it emphasizes those procedures which are of significance in agriculture, industry and medicine. The fifty exercises are clear and concise and are adapted for use with any standard textbook in the field.

Plants of the Bible. HAROLD N. MOLDENKE and ALMA L. MOLDENKE. 364 pp., 95 illustrations. Chronica Botanica Co., Waltham, Mass.; Stechert-Hafner, Inc., New York. (1952). $7.50.

Twelve years have elapsed since the authors began work on this modern, comprehensive survey of the plants and plant products mentioned in the Bible. This easily readable, pleasing book will be of interest and value to laymen and churchmen of all faiths, to nature- and garden-lovers, and to scientists. The volume is superbly illustrated with an abundant diversity of old and modern prints which, with the pleasing typography, adds to its popular appeal. It contains the only reliable index of Bible verses to be found in any old or modern book on the flowers, trees, other plants, and plant products mentioned in the Bible.

Biology and Language. J. H. WOODGER. 356 pp. Cambridge University Press, 32 East 57th Street, New York 22, N. Y. (1952). $8.00.

Dr. Woodger, Professor of Biology in the University of London, has previously written two books on scientific method: *The Axiomatic Method in Biology* and *The Technique of Theory Construction*. In the preface to the present volume, he says: "Since writing these books I have had an opportunity of learning more about these matters and of thinking independently about them . . . I hope the present book will have a wider appeal and be of greater and more direct help in improving the language of biology. It also deals with an aspect of the growth and development of science with which those former books did not deal: namely with the way in which theoretical statements come to be constructed on the basis provided by observations and experiments."

Ground Equipment and Insecticides for Mosquito Control. E. F. KNIPLING, Editor. 116 pp., illustrated. American Mosquito Control Association, Inc., Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Washington, D. C. (1952).

This booklet is based upon the latest available information on chemicals and ground equipment employed in mosquito control. It represents the composite experience of many workers. The bibliography and references contain much information of value.

LETTERS
TO THE EDITOR

I read Dr. Harriett B. Creighton's note to Dr. Hylander (April, 1952, *AIBS Bulletin*) with interest, but cannot feel too alarmed over a situation which I realize exists to some degree. I am much more interested in other facets of the problem.

I have furnished data to a number of Council groups and you may recall that the government has put out a number of bulletins in the last few years, particularly for servicemen, that will give anyone an idea as to potentialities in the field. I have no difficulty in finding data to give such bodies and see no reason why our Society should not have one of its existing committees devise material to be sent out with one of our mailings. I have never felt that we were competing with chemists and physicists since those students never take any botany, and to make it worse, they never have an opportunity to see an energetic department in action in the majority of our schools which feed the graduate schools . . . our smaller colleges. We might as well face the fact that we do not have the commercial outlets that one finds in chemistry. Neither do we have the stress on physics as such that is found in engineering schools and research. Furthermore, we are not under the medical umbrella with which many of our fringe groups have rushed to affiliate.

It seems then that we must turn to applied plant science or agriculture and related fields for our outlets and this seems to be under the control of the Civil Service or state institutions. I do not feel that we are sending students who are inferior to the average run of majors in physical sciences. I expect we send as many students to graduate school as any institution of our size and I believe that we are sending students of very good abilities; they are just not interested in physics and chemistry as such, regardless of income offered. I realize, however, that plant science suffers by virtue of our history and we must admit that in the liberal arts colleges we are further handicapped by indirect competition with the medics: the average zoology department is run for the benefit of the pre-medics and the average administration knows so little about the inner workings of biology that they refuse to recognize the fundamental nature of plant science.

Dr. Creighton's point is well taken and I hope that she can stimulate her group into action. After all, the Society is our largest single group, as far as numbers go, but the very nature of its membership makes it unwieldy. It is my feeling that we had better pay more attention to the firing line in plant science and support those individuals thereon with less stress placed on those large centers who move along in their usual pattern, and are untouched by current modes. The smaller institutions are our feeders . . . and we have a splendid service to render there.

J. FISHER STANFIELD, Head, Botany Dept.
Miami University, Oxford, Ohio.

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I would like to add my comment on the matter of salaries for biologists and the recruiting of graduate students. In our society, salary and prestige are more or less a measure of the contribution in valued goods and services that a worker makes to the community. Teaching, particularly in the liberal arts colleges, does not usually result in the direct production of economic wealth, and its intrinsic value has apparently not yet been fully realized by society in general. Artists, who contribute only to the cultural well-being of the community, and often to only a small segment, are usually subsidized by a small appreciative minority. On the other hand, physicists and chemists engage in research which is very profitable to industry or vital to the defense of the nation, and almost everyone is dependent on a physician at some time. Thus, these professions have a high prestige value and as long as the number of trained persons is well below the demand, the financial rewards will be high.

The importance of the biological sciences to society is gaining recognition, and there has been a great increase in the support of research. The need for superior teachers to train future researchers should become self-evident. But biology as a "pure" science, devoid of foreseeable value to the community, must await recognition with the arts as a "cultural" activity.

It would be unfair to young men and women to "recruit" them into a field where they will not find the rewards they seek. The recruiting of more biologists will not necessarily give us greater advances in biological knowledge; we may only have more underpaid and frustrated biologists, unable to find the positions their ability and training demand. The task of biologists is to make the public aware of the importance of their contributions, and as opportunities become greater, able young people will enter the field in greater numbers. I do not believe that what biology lacks is able biologists so much as able propagandists. Here is where the AIBS can fill a real need.

MARGARET LIEB, Research Fellow.
Kerckhoff Laboratories of Biology,
California Institute of Technology, Pasadena.

I wish to register a vigorous protest to the kind of thinking in our ranks that is expressed in the letter of Dr. Creighton (page 16, April *AIBS Bulletin*) and in your editorial (page 11-12 of the same issue).

Far from being concerned about recruitment, we should instead be concerned about overproduction. Your chart on page 17 clearly shows what is happening. Botanists are a dime a dozen and zoologists worth just a little bit more on the current market. The salary of virtually everyone of us is lower than it should be because we are so plentiful that we are in competition with one another. On virtually every campus the instructors in the field of biological science are paid less than men with similar training and abilities in the physical sciences. The competition of governmental agencies and industry for the services of the physical scientists has placed them in short supply. I wish that the situation was similar in the biological field.

Our graduate schools have long measured their success more in the quantity of their product than in its quality. We in the biological fields would do well to observe the situation in the medical sciences. Here there is a rigidly controlled supply of replacement doctors. While no one will admit that this is deliberate, and the standard excuses of limited facilities and high standards are used as explanations, the result is obvious. It seems that if we in the academic fields are ever to raise our standards of living up to that of medical men with similar ability and training we will have to control the supply of graduates. Certainly we stand to loose rather than gain by any type of recruitment. Incidently, who in his right mind can encourage a bright youngster to enter the biological fields today when the promise of income and prestige is so much richer in medicine, chemistry, physics or the business world?

JOHN D. BLACK, Professor of Zoology.

Northeast Missouri State Teachers College,
Kirksville, Missouri.

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I have been rather concerned over the number of biographical types of publications which have been prepared in the past several years and the extremely heavy solicitation which is placed on those whose names are included in the directory for the purchase of copies.

Recently, I received forms which, to me, represented the next thing to buying one's way into a directory. It seems to me that information relative to the validity of such directories should be available through the AIBS, and that is the reason for my writing to you. I believe that these directories as they have been prepared are for the purpose of making money for the publisher. If such is the case, I cannot understand how a publisher can ask for a voluntary contribution.

I shall be interested in knowing the reactions of fellow scientists to this situation.

KATHEL B. KERR.

Dr. Salsbury's Laboratories, Charles City, Iowa.

America's outstanding horticulturist, DR. LIBERTY HYDE BAILEY, received visitors at his home during the Cornell meetings. In this picture, with Dr. Bailey *(left)* are DR. BENJAMIN DUGGAR (center), discoverer of aureomycin, and DR. CHARLES THOM *(right)*, President of the Mycological Society of America for 1953.

ON EDITORIAL POLICY

H. BURR STEINBACH

Chairman, Editorial Committee

THE idea of a regular publication for the American Institute of Biological Sciences is as old as the organization itself. The present BULLETIN, an outgrowth of the earlier NEWSLETTER, was started by Dr. Clarence J. Hylander and nursed along by him with the wise advice of Dr. Ralph Cleland and his Editorial Committee, appointed somewhat over a year ago. The BULLETIN is now a success, in the sense that biologists are reading it with sufficient attention to make comments about what is wrong with it and in the sense that it has attained a relatively secure financial status. Some statement on editorial policy seems called for at this time.

The present Editorial Committee, in part, held a meeting during the recent sessions at Ithaca, N. Y. In characteristic committee style, it was found easiest to decide first what the BULLETIN should not do. It was generally agreed that the BULLETIN should not be (1) simply a "house-organ," (2) a newssheet or (3) a medium for the publication of original research reports. Existing publications, it was felt, could attend to these services in a more satisfactory manner than could a journal of limited size and publication time, such as the BULLETIN. On the positive side, the several service features of the BULLETIN were approved. These included "The Biology Library," "From the Societies," "The AIBS-cope," "Across the Editor's Desk" and short news items of a nature amenable to the publication schedule. Especially it was hoped that regular channels could be established with government agencies so timely reports of their activities could be included in the BULLETIN.

The Committee felt that the most valuable service the BULLETIN could perform would be to serve as a medium for discussion of subjects of general interest to biologists. Along these lines, the articles by Dr. Alan Waterman on the National Science Foundation and that by Dr. Marston Bates on "Where Is Biology"? were cited as examples of recent lead articles that satisfy these requirements. The Committee felt that this objective could be carried out best within the framework of a general plan involving solicited rather than voluntary contributions. Therefore, they authorized a tentative program of informative and, it is hoped, provocative articles on the training of biologists from the elementary level to the specialized professions. Plans for such a series have been activated.

The general make-up of an average issue of the BULLETIN will include, then, the now well-established service departments, a lead article on the subject of the current program, and presumably, an informative companion lead article on some agency or biological activity of very general interest. If the lead articles are a success, they should provoke reader participation in the "Letters to the Editor" section, which should grow correspondingly. Finally, there will be the advertising section, which the Committee regards as important for two reasons. In the first place, advertising is important to both advertiser and reader because it supplies the latter with the information the former wishes to convey. A select and cooperative group of firms, producing products of interest to all biologists, are now patronizing the BULLETIN. A second reason, equally important, is that the BULLETIN must pay its own way and the advertisers are an important source of revenue.

If this general plan for future publication is followed and the size restricted to what it is today, the BULLETIN will only rarely be able to print articles that do not fit directly into the proposed current topic. This is unfortunate, since unsolicited articles may frequently be of a desirable type. Biologists should not hesitate to send in manuscripts to the Editor for consideration but it is hoped that authors will be sympathetically understanding if the Editorial Committee feels that the BULLETIN cannot publish their manuscripts because of prior commitments to a general program. The Committee believes that it is unfair to all parties concerned to accept contributions for later, unspecified publication dates.

Mechanically, the BULLETIN is handled by the Managing Editor and Assistants in the Washington office. They decide the precise make-up of each issue and handle the material for some of the regular feature columns. Secretaries and other interested members of societies can render a useful service by sending to the BULLETIN items of interest to their society membership or to biologists generally. All correspondence should be addressed to the Editor, AIBS BULLETIN, 2101 Constitution Ave., Washington 25, D. C.

By 1954 it is hoped that the BULLETIN will appear on a regular bimonthly schedule in February, April, June, August, October and December. The August issue will continue to be a program number for the AIBS-sponsored fall meetings.

The Editorial Committee operates under the general guidance of the Governing Board which contributes a majority of the Committee members. Comments or criticisms, therefore, may be forwarded to the Committee either through the Governing Board or directly to the Chairman of the Committee.

Considerable cooperative effort was needed to establish the BULLETIN in the beginning. This cooperation is needed now to make the BULLETIN an organ of influence in American biology. The Committee hopes for widespread and vigorous participation on the part of interested individuals and societies. Much has been written in recent years of the need for intelligent and profitable communication in science. For biologists, the BULLETIN should be a challenging place for such communication.

A. I. B. S. Placement Service

In 1950 the AIBS Placement Service was begun on an experimental basis. It was not known at that time whether a national employment clearing house for biologists was desirable or necessary. Time has shown that a definite need exists and the Service has been reorganized recently to provide this liaison service.

REGISTRATION: Any biologist who is a member in good standing of an AIBS Member Society may register free of charge. Members of Affiliate Societies may register with the payment of a $3.00 annual fee. For all other biologists there is an annual registration fee of $5.00. Registration entitles a biologist to appear on 4 (quarterly) lists, where he will be listed by name, with home address and a brief résumé of his scholastic and professional qualifications. Applicants are expected to inform the Placement Service immediately when they accept a position or change their address.

EMPLOYERS: The quarterly lists of the Placement Service may be obtained on a subscription basis. The subscription prices are: (1) all four lists, $10.00 per year (2) single lists, $5.00 per copy. Biologists appearing on these lists are classified in the following fields: Anatomy & Embryology, Bacteriology, Biochemistry & Biophysics, Biology (general & marine), Botany, Ecology (plant & animal), Entomology, Genetics (plant & animal), Forestry, Horticulture, Pharmacology & Endocrinology, Physiology (plant & animal), Phytopathology, Wildlife & Conservation, Zoology.

For application forms, subscription contract forms or information write to:

Director, Placement Service,
American Institute of Biological Sciences,
2101 Constitution Avenue, Washington 25, D.C.

Welcome to the American Institute of Biological Sciences

BAILEY HALL, SEPTEMBER 8, 1952

DR. F. F. HILL
Provost of Cornell University

IT is a pleasure and an honor for me to welcome you to the campus of Cornell University.

If one could chart the material progress of mankind from the beginning of time to the present, I should suppose that for centuries progress would be revealed as having been painfully slow. Progress was necessarily slow so long as it was dependent upon empirical knowledge gained by the painful process of trial and error in small and more or less isolated communities.

As late as the year 1800, seventy percent of the population of the United States was engaged in agriculture for the simple reason that we had not accumulated sufficient knowledge about plants, animals, and engineering to enable us to do better. The same situation existed in almost every other country in the world. Any large population which has to devote so high a proportion of its total manpower to the job of producing enough food to maintain itself cannot possibly have a standard of living such as we associate with modern industrial civilization.

Material progress prior to the latter half of the 18th century, was indeed slow. It has been estimated, for example, that as late as the 14th century, wheat yields in England, a relatively advanced agricultural country, averaged no more than eight bushels per acre. By the middle of the 16th century, yields had increased to only nine and one-half bushels per acre and by the middle of the 18th century to only fifteen bushels per acre—an increase of seven bushels in four hundred years. During the past *two hundred* years, average wheat yields in England are estimated to have increased by twenty-one bushels per acre or, to be specific, from an average of fifteen bushels in 1750 to thirty-six bushels in 1950.

Equally spectacular increases in yields have occurred in other crops in other parts of the world. I should think it unlikely, for example, that the Indians of North America obtained average corn yields of more than ten bushels per acre compared with present day yields of one hundred bushels per acre which are not uncommon in parts of the Corn Belt.

Not only have crop yields increased, but equally important, the risk of widespread crop failures and resulting famine have disappeared in much of the world, although, unfortunately, not in all of it.

Our modern industrial civilization with its high standards of material well-being has been built on the foundation of adequate and regular food supplies the production of which, during the past century and one-half, has required the time and energies of a constantly decreasing proportion of our total population. In 1830, for example, seventy per cent of the gainfully employed persons in the United States were engaged in agriculture; in 1950 less than twenty per cent.

Before so large a proportion of the population in a country such as ours can be safely released to enter non-farming occupations, the efficiency of agricultural production must be relatively high and the reliability of production assured. These, in turn, depend upon an agricultural technology which has its roots deep in the biological and physical sciences.

It is true that in the earlier years of the so-called Agricultural Revolution—which began in the late 17th century—much progress was made as the result of transferring ideas and techniques from one community or one country to another. Agricultural innovators, such as Jethro Tull in England, also used what might be called the "cut and try" method to advantage. But it was the work of men such as von Liebig in plant physiology, Mendel in genetics, Pasteur in microbiology, and their fellow scientists, who laid the foundations for the remarkable material progress we have enjoyed in the western world during the past one hundred and fifty years.

The Industrial Revolution could not have progressed very far without the Agricultural Revolution which made it possible to release the major part of the population of the western world for activities other than producing food—for the professions, including medicine, for research, for industry, for business, for the arts. The Agricultural Revolution, in turn, could not have gone far without the careful and painstaking work of the many scientists, celebrated and uncelebrated, who over the years have given us greater understanding of biological and physical processes in the world around us.

We have not solved all of the world's problems nor will we have solved them even if we eventually succeed in helping men everywhere achieve standards of material well-being approaching those we enjoy in the United States. It seems clear, however, that a larger measure of material well-being is a first and necessary step in the direction of solving some of the most pressing of these problems.

You who devote yourselves to the biological sciences, both fundamental and applied, are entitled to enjoy, not only the satisfactions which come from adding to our understanding of the world in which we live, but the additional satisfaction that comes from knowing your work is basic to improving still further the welfare of mankind.

It is indeed a pleasure to welcome you to Cornell.

THE CORNELL UNIVERSITY MEETINGS

CLARENCE J. HYLANDER

Convention Director, AIBS

THE American Institute of Biological Sciences sponsored its third campus meeting for biologists at Cornell University, Ithaca, New York on September 8-10. Through a combination of factors—not the least being the geographic location, the Cornell tradition in the biosciences, and the variety of biological disciplines represented by the 24 participating societies—the meetings broke all records in attendance. It was undoubtedly the largest gathering of biologists ever to assemble in an American university setting. The four thousand or more who attended could not fail to be inspired by the obvious fact that biologists are numerically becoming an important factor in American science. Cornell is to be congratulated on its resourcefulness and hospitality in accommodating such a large group.

For fifty-one weeks of every year the American Institute of Biological Sciences may be nothing more to its members than a letterhead, a Washington address, or a series of committees pondering on the problems confronting biologists today. However, once each year AIBS becomes a flesh-and-blood reality, serving as a framework for a get-together of biologists in a suitable academic environment, providing the continuity of experience which can assist the able local committees in planning the multitudinous details which need attention in order to have the meetings a success. At Cornell several societies were welcomed into their first participation in the AIBS-sponsored meetings: the American Phytopathological Society, the American Society of Parasitologists, the American Society of Zoologists, and the National Association of Biology Teachers, just to mention a few. Their attendance added immeasurably to the variety of approaches which occupied the attention of biologists at the meetings.

The great diversity of interests which exist even within the field of the biological sciences was demonstrated by the societies represented at Cornell. General biology, botany and zoology were represented by the *American Society of Naturalists*, the *American Society of Zoologists*, the *Botanical Society of America*, and the *National Association of Biology Teachers*. Taxonomy, morphology, anatomy and field study were represented by the *American Bryological Society*, the *Fern Society*, the *Society of Plant Taxonomists*, the *Mycological Society of America*, the *Phycological Society*, and the *Society of Protozoologists*. Plant diseases and pathogenic organisms occupied the interest of the *American Phytopathological Society* and the *American Society of Parasitologists*. Crop and ornamental plants were the focus for members of the *American Society for Horticultural Science*. Genetics in all its aspects was the concern of the *Genetics Society of America* and the *American Society of Human Genetics*. Microbiology was represented by the *Society for Industrial Microbiology;* microscopy by the *American Microscopical Society;* fresh and salt water biology by the *American Society of Limnology and Oceanography;* physiology by the *American Society of Plant Physiologists* and the *Society of General Physiologists;* ecology by the *Ecological Society of America;* and evolution by the *Society for the Study of Evolution*.

ON THE SCIENTIFIC SIDE . . .

The participating societies held numerous sessions in which opportunity was provided for presentation of some 1,300 papers by biologists reporting on specialized problems in research, teaching, and applied biology. To these might be added about 100 papers presented by title only. However an important phase of a joint meeting of societies is the opportunity it presents of cooperating in symposia and panel discussions which cover overlapping fields of interests. A great number of excellent symposia sponsored by two or more societies were the highlight of the Cornell meeting.

Symposia on NITROGEN METABOLISM IN PLANTS and HERBICIDAL ACTION OF CHEMICALS were given jointly by the American Society for Horticultural Science, the American Society of Plant Physiologists, and the Botanical Society of America. PLOT TECHNIQUES IN HORTICULTURAL RESEARCH was presented by the American Society for Horticultural Science and the Biometric Society of Eastern North America. BIOCHEMICAL EVOLUTION was presented by four societies: the American Society of Naturalists, the Society for the Study of Evolution, the Genetics Society of America, and the American Society of Zoologists. A symposium on TEACHING OF ECOLOGY IN URBAN AREAS was given by the Ecological Society of America and the American Society of Zoologists. The LIFE CYCLE OF AN ANGIOSPERM was presented by both the Botanical Society of America and the Ecological Society of America. Symposia within societies included MODERN METHODS OF MICROSCOPY (American Microscopical Society); DISEASE RESISTANCE IN PLANTS, PLANT PARASITIC NEMATODES, PHYSIOLOGY OF PARASITISM, AND ANTIBIOTICS (American Phytopathological Society); GENETICS OF VARIOUS CONSTITUTIONAL DEFECTS and COUNSELLING CLINICS IN HUMAN HEREDITY (American Society of Human Genetics); UNDERGRADUATE TRAINING OF PROFESSIONAL BOTANISTS (Botanical Society of America); EVOLUTION OF TISSUE SYSTEMS IN PLANTS (Society for the Study of Evolution); TEACHING THE ANATOMICAL SCIENCES AT THE UNDERGRADUATE LEVEL (American Society of Zoology); and PLANT GENERA, THEIR NATURE AND DEFINITION (American Society of Plant Taxonomists).

Presidential addresses at the numerous society dinners, as well as lectures by invited biologists, provided an additional source of inspiration beyond the limited areas of individual specialization. Among these was the CHARACTERISTICS OF CERTAIN SPECIES OF ACTINOMYCETES by B. M. Duggar; the GEOLOGICAL HISTORY AND EVOLUTION OF INSECTS by F. M. Carpenter and presented by Sigma Xi; HUMAN GENETICS AS A SCIENCE, AS A PROFESSION, AND AS A SOCIAL-MINDED TREND OF ORIENTATION by F. J. Kallmann; GENE AND ORGANISM by Sewall Wright; the SIZE OF NUCLEI AND CELLS by Franz Schrader; BIOTIC COMMUNITIES OF NORTH AMERICA by S. Charles Kendeigh; PLANT ANATOMY IN THE SERVICE OF OTHER BOTANICAL SCIENCES by Katherine Esau.

The more rugged members of various societies participated in numerous trips and forays to observe at first hand the biota of the Cornell locale. Paleobotanists pried loose the secrets of the Devonian shales adjacent to Cayuga and Canandaigua Lakes. Phycologists scanned the cliffs surrounding Buttermilk Falls in their search for algae. Limnologists visited the aquatic communities of numerous lakes and glens. Bryologists scrambled through the Junius bog in their search for mosses and liverworts. Mycologists went all-out for a three-day foray to Coy Glen, Michigan Hollow and various Lloyd-Cornell preserves. Let us hope that the local wild life survived the encounter with these determined field biologists. Others took

their field work more leisurely, in small groups scattered on the lawns, beneath the famed Cornell elms and maples. These comfortably sprawling biologists may well have been members of the American Society of Human Genetics, or of the Society for the Study of Evolution, taking candid notes on the behaviour of their fellow biologists. In spite of the attraction of the outdoors and the glorious early fall weather, the meeting rooms were crowded to capacity.

STATISTICS . . .

No report of a convention would be complete without the statistical data which gives a quantitative evaluation of the meeting. Unimportant though they are, and naturally reflecting the current American misconception that what is bigger must be better, the following data on the Cornell meeting are presented as a record of a most unusual assemblage.

Some 3,200 registered as participants in the meetings. To these can be added the 800 or more registered guests and wives. The 4,000 thus accounted for were housed on or near the campus by the efficient housing committee. Guests at local faculty homes swelled the total a few more hundred, so that the overall attendance was approximately 4,200.

The General Program listed 1,392 papers of which some 100 were read by title. It is interesting to note that every state except Idaho was represented by a biologist giving a paper at some society meeting. As might be expected New York led with 163 papers; surprising (except to Californians) were the 99 papers presented by California; Maryland came in third with 96. Then followed Illinois with 81, Michigan with 75, and Massachusetts with 75. Twenty-five or more titles came from each of the following: Wisconsin, Indiana, Ohio, Connecticut, Iowa, Missouri, Minnesota, Pennsylvania, Texas, New Jersey, Florida, North Carolina and Washington.

A break-down of the registration reveals the cosmopolitan nature of the AIBS-sponsored meetings. Forty-seven states, the District of Columbia, Alaska, and Hawaii were represented. Our neighbor Canada participated 165 strong (41 presented papers). United States registration by states with significant numbers present were:

Officers of Societies attending the Cornell Meeting of the AIBS, September 8-10, 1952.

Left to right. **Row 1:** E. B. Babcock (Society for the Study of Evolution); F. J. Kallman (American Society of Human Genetics); F. Schrader (American Society of Zoologists); T. C. Byerly (AIBS); Geneva Sayre (American Bryological Society); W. R. Singleton (Genetics Society of America); S. L. Meyer (AIBS); J. C. Gilman (Mycological Society of America).

Row 2: R. R. Kudo (Society of Protozoologists); F. C. Gates (Ecological Society of America); D. D. Keck (American Society of Plant Taxonomists); H. E. Stork (National Association of Biology Teachers); G. L. McNew (American Phytopathological Society); W. N. Hess (American Society of Zoologists); G. H. Rieman (Potato Association of America).

Row 3: S. Wright (American Society of Naturalists); L. R. Blinks (Society of General Physiologists); R. H. Fleming (American Society of Limnology and Oceanography); H. W. Norton (Biometric Society of Eastern North America); D. I. Arnon (American Society of Plant Physiologists); C. J. D. Brown (American Microscopical Society); E. T. Moul (Phycological Society of America).

New York	701	Connecticut	99
Maryland	215	California	97
Mass.	171	North Carolina	79
Pennsylvania	169	D. C.	70
Illinois	164	Florida	66
Michigan	153	Minnesota	53
Ohio	122	N. H.	53
N. J.	120	Texas, Iowa (each)	49
Wisconsin	113	Virginia	47
Indiana	110	Missouri	43

Twenty-three foreign countries were represented. Among them were South Africa, Australia, Austria, Belgium, Bolivia, Brazil, China, Egypt, England, France, Honduras, India, Iran, Israel, Italy, Japan, Netherlands, Norway, New Zealand, and Switzerland.

Miscellaneous statistics reveal other aspects of the Cornell meetings. For example, the cafeteria at Willard Straight did nobly in serving 20,000 meals between Sunday and Wednesday . . . at least 300 biologists who appeared unexpectedly on Saturday with reservations for Sunday, were housed with relative equanimity by the convention personnel . . . an observant pedestrian reported 4,360 steps (all uphill) between Baker Dormitories and Warren Hall . . . at least 3,000 attended the Biologists' Smoker in Barton Hall, consuming 2,500 bottles of Pepsi-Cola (courtesy of the Pepsi-Cola Company) and 25 gallons of cider!

THE BIOLOGICAL SCIENCES EXHIBIT HALL . . .

A national meeting such as that at Cornell presents an unusual opportunity for the participants to get first-hand information on the new books, instruments and materials which are the tools of the biologists because a number of commercial concerns are willing to take part in the Biological Sciences Exhibit. Twenty-seven such concerns were at Ithaca, in the roomy exhibit hall provided in Barton Hall, central to all activities.

Many publishers with books of interest to biologists staffed booths for their various companies: Academic Press, Association of University Presses, Blakiston Company, Burgess Publishing Company, Houghton-Mifflin Company, Interscience Publishers, Macmillan Company, C. V. Mosby Company, Prentice-Hall, W. B. Saunders, D. Van Nostrand, and John Wiley and Sons. Other publishers contributed books to the AIBS Biology Library: American Book Company, Charles Scribners Sons, Chronica Botanica, C. C. Thomas, Elsevier Press, W. H. Freeman & Company, Harper and Brothers, D. C. Heath and Company, Henry Holt and Company, Henry Schuman, and Lea & Febiger. As a result, biologists had a unique opportunity to easily scan the new texts and reference books in their fields.

The exhibit hall also presented an opportunity to see the laboratory equipment and materials available from the exhibitors in these fields: American Instrument Company, American Optical Company, Bausch & Lomb Optical Company, Difco Laboratories, Hamilton Bell, National Spectrographic Laboratories, the Technicon Company, Carl Zeiss, Inc., the Carolina Biological Supply Company and Ward's Natural Science Establishment.

SOCIAL OVERTONES . . .

Since the members of the various biological societies have begun meeting on college campuses, it is becoming increasingly evident that biologists are not as socially maladjusted as some reports of the past would have us believe. It is, of course, important to attend sessions at which the scientific papers are presented; to attend society business meetings; and to take in as many symposia and lectures as one's intellectual stamina can endure.

On the other hand, it is stimulating to meet old friends and talk over mutual problems on the greensward or in the dormitory lounge. It is a good sign (as well as an indication of a reasonably priced ticket) to find that all of the society banquets and special meals were over-subscribed; over 480 attended the banquet of the American Society for Horticultural Science, 300 the banquet of the Botanical Society of America.

A tea for all those present was given in Willard Straight Hall on the Sunday before the meetings began, by the local chapter of Sigma Xi. This enabled many to meet old friends and make new acquaintances before the hectic schedule of sessions got under way. A tour to the Corning Glass Center was very well attended. A luncheon given by the Governing Board of AIBS for the presidents of the twenty-four participating groups gathered together a most representative segment of American biology for a social as well as informative event. The Biologists' Smoker, held the last evening in Barton Hall, became a gala affair where one could find almost every biologist who had attended the previous sessions; the ample space made it possible to circulate as well as to breathe. As the hall cleared at midnite, the 1952 meetings officially became history.

AND IN CONCLUSION . . .

The AIBS-sponsored meetings are arranged by close cooperation of the AIBS staff and a local committee composed of representatives selected in advance by each of the participating societies. The Local Committee on Arrangements knows the local scene, can secure liaison with the administration and service departments, and in many ways can attend to all the details from darkening conference rooms to making signs as guides to the campus buildings. It can be reiterated that a satisfactory joint meeting—especially one of the proportions of the Cornell meeting—is no accident. Chairman of the Cornell local committee was tireless and good-humored Dr. C. E. F. Guterman, at the helm for the past year in working out the local plans. Associated with him were such able men as Drs. H. P. Banks and R. E. Lee (housing and registration personnel); Dr. S. S. Atwood (housing); Dr. G. C. Kent (banquets and special meals); Dr. S. L. Leonard (Smoker); Dr. F. C. Steward (transportation and signs); Dr. W. J. Hamilton (special events); Dr. L. H. MacDaniels (meeting rooms); Drs. D. R. Griffen and E. S. Phillips (visual and audio aids); and Dr. G. H. M. Lawrence (public and press relations). To this group the 4,000 attending biologists owe thanks for a well-planned enterprise.

In the background, at Cornell, were members of the Ohio State and of the Minnesota local committees, enjoying a meeting while reminiscing of their hectic moments in 1950 and 1951. More in the foreground were members of the newly chosen Wisconsin local committee, taking notes for the 1953 meeting. On the basis of this, the fourth AIBS-sponsored meeting, at the University of Wisconsin, should be another memorable event for biologists.

Due to lack of space in this issue, the feature **"Know Your Societies"** does not appear. It will be continued, however, in the January issue of the *AIBS BULLETIN*.

THE PROPOSED SCIENTIFIC MANPOWER COMMISSION

SCIENTIFIC and technological manpower problems have been before educational institutions, professional societies, the military, and governmental agencies for some time; and even though there is by no means unanimous agreement as to the details and the ramifications of the problems, their general nature is so well known as to require no restatement in this document. For the most part, action aimed to solve the problems has been undertaken by government agencies, with the aid and advice of scientists or of professional organizations; but these agencies have specifically directed and rather restricted outlooks and objectives that leave many points unresolved.

From the events of the past two years it is evident that the professions themselves must take an active part in the solution of their own problems, and this conclusion has already been reached by several professional groups. The medical profession has been quite active, and the creation of an Engineering Manpower Commission by the Engineers Joint Council has been so instrumental in clarifying the manpower situation in the engineering professions that scientists may well take cognizance of the results and consider whether comparable action involving the scientific disciplines may not be warranted at this time. Indeed, this is the theme and purpose of this communication.

Several governmental agencies are already interested in certain aspects of the manpower situation, and there is no need for a policy-making body that will duplicate functions that are already being adequately performed. There is, however, an urgent need for an informed group or commission, composed of professional scientists, who have access to the pertinent facts in their respective disciplines, who are prepared to make effective use of these facts wherever and whenever the need arises, and who will utilize them in a program of public education that will inform the public and their representatives in the Congress regarding current needs, prospective or actual shortages of manpower, and such other personnel matters as may bear upon the defense situation and upon the national welfare. Such a commission, although acting in behalf of scientists and scientific organizations, should have full authorization and organizational independence to develop and to pursue a program without seeking approval of each step from each of the adhering scientific groups.

A few individual societies have appreciated the manpower problems within their own disciplines and have taken steps to meet them. It is not the intent to have the proposed commission take over functions and responsibilities that should be assumed by individual societies or groups of societies. The general situation, however, is one in which coordinated action on the part of all major scientific groups is required, for there are things to be done that no one society can attempt, and that apply to all the scientific professions. Most serious among the several examples that can be selected are widely divergent opinions regarding the actual manpower situation, not to mention the widespread public reaction, reflected in Congressional legislation, as to the relative importance of military service as compared with scientific and technological service in the present emergency. Even in the military, where extensive and intensive use is being made of technology, ignorance or indifference is commonly displayed in the use made of scientists and technologists. The attitudes toward science and technology are sound, but they have not been transferred to the personnel, which provides the only means of delivering scientific and technological results.

There seems to be only one solution, for which the scientists, and the scientists alone, can and must assume responsibility. It is a program of public education that should ultimately extend in all directions and to all levels. Although facts can be placed before the members of Congress, Congressmen are much more impressed by public opinion and public reaction in their respective districts; hence public reaction must be based upon well-informed opinions that will, in turn, influence Congressmen to pass judicious legislation. There is even reason to believe that industry, like the military—though not to the same degree—is not always making the most economic use of scientific manpower, hence a program of "education" can effectively be designed for the industrial users of manpower.

From this partial statement of the problem it is evident that there is work to be done that transcends the resources and the scope of any individual scientific society. It is equally clear that parts of this program cannot be undertaken by any non-profit organization, and that there should be a group—the proposed Scientific Manpower Commission—appointed to devote its time and its energy to the questions that must be answered, and to activities that are now in large measure neglected because they do not fall within the province or jurisdiction of governmental agencies, or lie outside the constitutional and legal limitations imposed upon the individual societies and scientific institutions.

To meet the needs that are indicated or implied in the preceding statements, representatives of the American Chemical Society, the American Geological Institute, the American Institute of Biological Sciences, the American Institute of Physics, the Federation of American Societies for Experimental Biology, and the American Association for the Advancement of Science have held several meetings aimed to formulate proposals that can be placed before the governing bodies of these six organizations, as well as others that should be involved in such action as is recommended and as may be taken. Careful consideration has been given to the question of representation, and it is the consensus among the representatives of the six groups named that fields or major disciplines should be represented, rather than individual organizations or societies. It is for this reason that the Institutes, the Federation, and the AAAS have been chosen; and, of course, the American Chemical Society is the one inclusive organization in the field of chemistry. It is recognized, however, that these six organizations do not include the whole of science, and the subcommittee charged with the responsibility of surveying the question of representation believes that the American Psychological Association should be invited to participate, and that the mathematical and astronomical societies should likewise be consulted to determine whether separate representation of these two disciplines is advisable and is desired.

The engineers have already taken steps to handle the engineering manpower problem through the Engineering Manpower

Commission, hence there is no need for representation of this group. Indeed, it is the intention that the Scientific Manpower Commission will parallel the EMC, and that it will work in harmony with it. To assure harmonious and coordinated action, it is proposed that a representative of EMC be invited to attend policy meetings of the SMC, participating in discussions but without vote. It may be expedient and desirable to have similar representation from the medical profession, as well as from the agricultural groups which, so far as is known, have not yet taken formal action with respect to manpower problems.

Intelligent action is predicated upon full information of current developments in every area, and a Scientific Manpower Commission must be certain that its activities are based upon full knowledge of, and coordination with, the manpower policies that are guiding governmental agencies. It is urgent, for this reason, that non-voting representatives of the several governmental agencies concerned also be invited to participate in the policy-making meetings of SMC. Among these agencies are the National Research Council, the NSRB, the National Science Foundation, the Department of Defense, the Department of Labor, and possibly the Office of Education. It may also prove expedient to keep in active touch with the work of private agencies—for example, the National Manpower Council at Columbia University.

The details of organization proposed for SMC are tentative, and it is expected that they will be modified in accordance with experience, financial limitations, and available personnel.

There is reason to urge the early establishment of the Commission, because the scientific manpower situation is acute, many aspects of it are receiving little if any attention, and all the time available is needed to develop a program that will be effective when and if new legislative and other emergencies arise. The organizations that are being asked to act can be assured that their representatives have given most careful consideration not alone to the problems of scientific manpower and the organization of a commission, but also to the responsibilities and interests of their respective groups. It is hoped that the Commission can be made a reality before the close of the current year.

HOWARD A. MEYERHOFF,
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Career Guidance and Scientific Manpower

TWO articles of significance to biologists are presented to the readers of this October number of the AIBS BULLETIN. At first glance, they may appear to be unrelated. One is a description of the present state of career guidance literature in the field of biology by W. H. Bragonier; the other is a statement on the proposed Scientific Manpower Commission by Howard Meyerhoff.

The intimate relationship between careers in science and scientific manpower is strikingly demonstrated in a statement of the "Policy on Training and Utilization of Scientific and Engineering Manpower" which appeared in the *Federal Register* (Volume 17, Number 175, pages 8070-8073) for September 6, 1952. There it was stated in no uncertain terms that

"It is the policy of the Federal Government to take and to encourage the taking of action which will aid in achieving the following objectives:

A. To utilize most efficiently existing resources of scientific and technical skills in private industry, in the civil government, in the armed forces and in educational institutions.

B. To develop increasingly reliable information regarding requirements and resources of scientists and engineers to meet both immediate and long-term national needs.

C. On the basis of needs indicated under B, to attract and train the additional number of able young men and women required for scientific and technical fields.

Industrial employers, educational administrators, scientists and engineers, as individuals, and professional associations of scientists and engineers, have an important responsibility to assist in achieving these objectives."

Essential actions to be directed toward achieving the above goals are recommended to employers of scientists and engineers, educational institutions, and professional associations of scientists and engineers. The latter are urged:

"1. To undertake informational programs designed to bring to the attention of students, through normal educational channels, and to individuals employed in sub-professional positions but possessing an aptitude for science or engineering, the career opportunities in scientific and technical fields in order to attract into these fields additional students with the required ability and interest.

2. To cooperate with appropriate public and private agencies in determining current and long-range requirements and resources of scientists and engineers and in developing relevant information regarding their employment, such as salaries, hours, mobility, and working conditions.

3. To cooperate with educational institutions in studying the adequacy of existing curricula in the sciences and in engineering, in developing better teaching methods and in achieving maximum utilization of teaching facilities in scientific and engineering fields."

The AIBS is one of the "professional associations of scientists" referred to in the above statements issued by the Office of Defense Mobilization. It provides an effective medium by which biologists can assist the government in achieving the objectives set forth in its statement of defense manpower policy and in formulating a wise program for the use of scientific personnel. This is exactly the kind of service the AIBS was created to perform.

S. L. M.

Vocational Counseling in the Biological Sciences

W. H. BRAGONIER

Department of Botany and Plant Pathology, Iowa State College

PEOPLE are happiest at work in which they succeed . . . people succeed at work in which they are interested and for which they have sufficient training and native ability.

During and following World War I much interest was developed in tests devised for measuring native ability . . . so-called intelligence or I.Q. tests. Today these tests are recognized as valuable tools for the counselor. Such tests alone, however, do not provide sufficient information about an individual to make possible wise vocational counseling. To provide some of the additional information needed, interest questionnaires and inventories have been developed. Scores from these devices indicate the areas into which a person's interest fall and when used with scores from intelligence tests and with other data they provide a sound basis for vocational counseling.

The use of interest inventories in counseling received a stimulus from World War II similar to that received by intelligence testing from World War I. Since the war, vocational counselors have used tests and inventories to help returning service men find the fields in which they have major interests and for which they are best prepared. Their efforts have been appreciated by the veterans and the extent to which they have been successful is indicated partly by the fact that most educational institutions, secondary and collegiate, now have vocational counseling services available for their students.

More literature on vocations is needed if counselors are to operate efficiently. Some large companies have published attractive brochures describing in an excellent manner the advantages, and disadvantages of vocations associated with their work. A few professional societies and honorary clubs have published material describing careers in the fields they represent. The volume of literature available at the present time in the fields of engineering, chemistry, agriculture, home economics and the social sciences is large. Several business firms prepare and publish vocational guidance material for sale to schools. Bibliographies and abstracts of pamphlets on careers in certain fields may be obtained.

Recently, Dr. H. Creighton and Dr. C. J. Hylander raised a question concerning the availability of vocational literature in the field of biology. Dr. Creighton indicated that numerous requests for vocational information were being received by her as secretary of the Botanical Society of America. Dr. Hylander presented sample letters received by him in which requests were made for literature on career opportunities in the societies represented by the A.I.B.S. Both indicated they had no appropriate publications to send.

As a Counselor of both high school and college students during the past nineteen years, the author frequently has needed vocational guidance material on the various fields of biology. In response to a recent request the voluminous files of two guidance counselors were searched for material on botany. Three excellent but very brief statements were found. These carried no illustrations and were written primarily for counselors. *Nothing* was available that could be used to present the field of botany in an attractive and interesting manner to high school and college students. Further search revealed very little information on any of the other biological sciences, except medicine.

With so little vocational information available some counselors find it difficult to explain the difference between the various fields of biology. They encounter much greater difficulty when they try to provide detailed information about a specific field. Even though the counselor is able to provide some worthwhile information, the notes taken by the students compare unfavorably with the well-illustrated pamphlets on such fields as nuclear physics, chemistry, electrical engineering and medicine. When they read the excellent literature describing these and other fields, the students and their parents turn away from the biological sciences, even though the tests and questionnaires indicate some phase of biology is the field of major interest. The net result is that many excellent students with the qualifications necessary for successful careers in the biological sciences choose careers in other fields. Some of them drift back, but many of the best ones do not, and, even though they may be successful, it is possible they would have been more successful and, also, happier had they chosen some field of biology.

In July, 1952, a request was sent to the secretaries of fourteen biological science societies and the National Research Council for: (1) an estimate of the number of requests for occupational information received in the past year; (2) a brief statement as to the type of information requested; and (3) a brief general summary of the replies sent.

Of the thirteen secretaries responding, three reported no requests and ten reported a total of 183. The ten also replied that they had nothing in print available for distribution. It is probable that other societies would report similarly if contacted.

Though the amount of evidence is limited, perhaps it is enough to justify the following conclusions:

1. Vocational guidance counselors need attractive literature describing the various vocations open to students.

2. Though many vocations are well covered at present, biology is not.

3. Ten biological society secretaries have received 183 requests for vocational guidance material during the past year and they had no printed material to send.

4. Biologists need to prepare well written, appropriately illustrated vocational guidance pamphlets for high school and college counselors and students, if interested, capable young people are to be attracted to careers in biology.

Which Way?

DR. BRAGONIER has outlined the situation that exists today. Young people are asking questions . . . questions that are not always easy to answer. Many are questions that were not asked by preceding generations. They are asking questions of professional guidance counsellors in high schools and colleges, they are asking questions of you and me. What, for example, is a biologist? An entomologist? A physiologist? A geneticist? An ecologist? Exactly what kind of work does he do? Is his work principally indoors or in the field? How much college training is necessary to obtain a position in a certain field? Will a B.S., a M.S., or a Ph.D. be needed? Are positions plentiful? What areas of specialization present the greatest opportunity? What will be the situation in five years? In ten years? Will the greatest number of positions be in educational institutions, the state or federal government, or in private industry? What salary ranges can be expected? Such questions cannot be answered satisfactorily by the majority of vocational guidance counsellors or even by those of us who call ourselves biologists. The reason has nothing to do with our skill or devotion to the science. We simply do not have adequate information to give to those who raise such inquiries.

Biology includes well over a score of divisions or specializations . . . with nearly as many "ologists" as fields of research. A man becomes a specialist before he obtains his Ph.D. The young person who expects to do graduate work may not be sure what kind of a specialist he would, or should, become. And he probably has no idea of becoming—just a biologist. Where can he find the answers to his questions? Several alternatives have been taken by different organizations. In some areas of science the individual society, as the spokesman for a special field, has undertaken to provide the answers. An example of such an undertaking is that of the American Society for Metals. This engineering society of metallurgists has produced a most attractive brochure, illustrated and well-planned, that tells the inquiring student all he wishes to know about the field of metallurgy, the opportunities it offers and the schools at which he can obtain training. Copies are distributed free of charge to colleges and to individuals.

In other instances, the national organization representing a certain field has published and distributed booklets about their particular area. For example, The American Chemical Society has published a colorful 16-page pocket-sized booklet, called "Shall I Study Chemistry?" which is distributed free to individuals and non-profit organizations such as schools and colleges. The first printing of this brochure, in the spring of 1952, ran to 75,000 copies. A second printing of 75,000 has just been completed. A more complete guidance booklet is the 40-page "The Chemical Profession—An Educational and Vocational Guidance Pamphlet" which is available at 25¢ a copy. Over 12,000 of these have been sold. The American Geological Institute has produced an 8-page offset booklet, without illustrations, entitled "Shall I Study Geology?". Some 20,000 copies have been printed and distributed free of charge to individuals. Orders of over 200 are filled at cost price.

Another alternative, the desirability of which is questioned by a number of scientists, is to allow, and even assist, commercial concerns to prepare and sell appropriate literature about vocations in science. A limited amount of such material in the field of biology is now available. Some of it is reasonably accurate. Much of it is insufficiently detailed.

The possibility of industrial subsidization of career booklets exists. A reliable concern, whose employees are largely biological or whose products are used by biologists, might be interested in such a venture. An arrangement of this type has proved satisfactory in another field. The suggestion has been made that it would be better to cooperate with a business enterprise in the publication of guidance literature than to have inadequate material for biology.

Many outstanding biologists, with years of experience in research, teaching, and administration, have indicated interest in this subject and a willingness to supply information about their fields. Surveys have been made from which information on salary ranges, "limited" fields, and future needs can be obtained. With the cooperation of those interested in the preparation of accurate guidance information about the biological sciences and with adequate financial support, it should be possible to prepare excellent guidance booklets to assist students in their choice of careers.

BIOLOGICAL PROGRAMS AT AAAS ST. LOUIS MEETING

DECEMBER 26-31, 1952

THE 119th meeting of the American Association for the Advancement of Science will include sessions of all 18 AAAS sections and of some 45 participating societies. The sessions of Section F, Zoological Sciences, and of Section G, Botanical Sciences, will be held largely in the Kiel Auditorium and the nearby Hotel Statler . . . headquarters for the biological groups. Details of particular interest to biologists follow:

AAAS SECTION F—ZOOLOGICAL SCIENCES

I. Cosponsorship of the afternoon and evening programs of the Society of Systematic Zoology, *Dec. 27-30.*

II. Sessions for contributed papers in (a) general zoology and animal behavior; (b) embryology; and (c) physiology, *Dec. 29, 30, morn.*

III. Biologists' Smoker, joint with Society of Systematic Zoology, *Dec. 29, eve.*

IV. Symposium: **Survival of Normal and Neoplastic Tissues after Freezing.** AAAS Section F. and Section N-Medical Sciences, together with Medical Organizations are cosponsors of this distinguished program of the Institute of Biophysics, St. Louis University. E. V. COWDRY and JACOB FURTH, Presiding. *Dec. 29, morn. and aft.*

Speakers include: RALPH A. DETERLING, A. CECIL TAYLOR, B. LUYET, WILLIAM H. BAUER, EUGENE L. HODAPP, HAROLD MERYMAN and others.

V. Zoologists' Dinner, joint with the Society of Systematic Zoology, and Vice-Presidential Address of Section F, *Dec. 30.* WALDO L. SCHMITT. **Applied Systematics.**

HERPETOLOGISTS LEAGUE

Symposium: **Common Names of Reptiles and Amphibians of the United States,** *Dec. 30.*

SOCIETY OF SYSTEMATIC ZOOLOGY

I. Public Discussion Panel 1: **Time's Arrow and Evolution,** by Harold F. Blum. *Dec. 27, 2:00 p.m.,* R. E. BLACKWELDER, Presiding.
Discussants: G. G. SIMPSON, WENDELL LATIMER, EDGAR ANDERSON and URLESS N. LANHAM.

II. Public Discussion Panel 2: **The Meaning of Evolution,** by G. G. Simpson. *Dec. 27, 4:00 p.m.,* G. W. WHARTON, Presiding.
Discussants: HAROLD F. BLUM, GLENN L. JEPSEN, E. T. SMITH and T. C. SCHNEIRLA.

III. Symposium: **Life History Studies in Relation to Systematics,** *Dec. 27, eve.,* E. RAYMOND HALL, Presiding.
1. Parasitic Worms. HORACE W. STUNKARD.
2. Fishes and Amphibians. GRACE L. ORTON.
3. Social Insects. CHARLES D. MICHENER.

IV. Symposium: **Anecdotal Sketches of Famous Zoologists.** *Dec. 28., aft.* ALEXANDER PETRUNKEVITCH, Presiding.
1. Charles Darwin as a Barnacle Specialist. H. A. PILSBRY.
2. Charles Wardell Stiles. FRANK G. BROOKS.
3. E. D. Cope and O. C. Marsh. ALFRED S. ROMER.
4. David Starr Jordon. CARL L. HUBBS.
5. August Weissmann. ALEXANDER PETRUNKEVITCH.

V. Motion Picture: "The Last Frontier," the unexplored depths of the sea as revealed by the benthograph of the Allan Hancock Foundation; narration by JOHN S. GARTH. *Dec. 28, eve.*

VI. Sessions for contributed papers in taxonomic and systematic zoology. *Dec. 29, 30, morn.*

VII. Public Discussion Panel 3: **A Comparison of Three College Biology Textbooks Written with Three Approaches . . . Principles, Systematic, Humanistic.** (The texts: *General Biology for Colleges,* GAIRDNER B. MOMENT, *Biology and Its Relation to Mankind,* A. M. WINCHESTER, and *Biology—Its Human Implications,* GARRETT HARDIN.) *Dec. 29, aft.*
Panel: The three Authors with Discussants WILLIAM ETKIN and RUTH S. BREEN.

VIII. Public Discussion Panel 4: **A Comparison of Three College Zoology Textbooks Written with Three Approaches . . . Principles, Systematic, Ecological.** (The texts: *Man and the Animal World,* B. R. WEIMER, *College Zoology,* K. A. STILES and *College Zoology,* F. R. HUNTER). *Dec. 30, aft.*
Panel: The three Authors with Discussants W. C. CURTIS and C. D. DUNCAN.

SOCIETY OF THE SIGMA XI

Annual Address: **Africa and the Origin of Man** by D. M. S. WATSON, Emeritus Professor of Zoology, University of London and Alexander Agassiz Professor of Zoology, Museum of Comparative Zoology, Harvard University. *Dec. 29, eve.*

AAAS SECTION G—BOTANICAL SCIENCES

I. Symposium: **Improvement in the Teaching of Taxonomy.** *Dec. 28, morn.* LINCOLN CONSTANCE, Presiding.
1. Introduction. A. J. SHARP.
2. The Renaissance of Taxonomy. PAUL WEATHERWAX.
3. Teaching General Principles and the Local Flora by Means of Field Work. MARTIN L. GRANT.
4. Aids to Memory in Teaching Taxonomy. RAY C. FRIESNER.
5. Effects on Students of Different Teaching Techniques. GEORGE J. GOODMAN.

II. Symposium: **Biosystematics and Taxonomic Units.** *Dec. 28, aft.* NORMAN FASSETT, Presiding.
1. The Elimination of the Splitter. ARTHUR CRONQUIST.
2. The Data and Dogma of Biosystematics; Their Effects on Taxonomy. CHARLES B. HEISER, JR.
3. Experimental Approaches to the Problems of the Species and the Problem of the Genus. EDGAR ANDERSON.

III. Symposium: **Nitrogen Metabolism in the Green Plant.** Joint program of AAAS Section G, Illinois Section of the American Society of Plant Physiologists and the American Society of Naturalists. *Dec. 29.* WALTER G. FRANKENBURG, Presiding.
1. Biological Nitrogen Fixation. ROBERT H. BURRIS.
2. The Relationships Between Nitrogen Metabolism and Virus Biosynthesis. BARRY COMMONER.
3. Nitrate and Ammonia Metabolism. C. C. DELWICHE.
4. Nutritional Factors in Protein Synthesis. ERNEST B. EARLEY.
5. Amino Acid Metabolism and Morphogenesis. ROBERT A. STEINBERG.
6. Protein Synthesis. FREDERICK C. STEWARD.
7. Biochemistry of Nucleic Acids. WALDO E. COHN.

IV. Symposium: **The Western Range—Our Great Natural Resource.** Joint program of AAAS Section G, the Ecological Society of America and The Grasslands Research Foundation. *Dec. 29, aft.* F. W. ALBERTSON and D. F. COSTELLO, Presiding.
1. The Western Range—What Is It? DAVID F. COSTELLO.
2. Grass-Animal-Soil Relationships Historically Reconsidered. JAMES C. MALIN.
3. Fruits of Settlement. FREDERICK G. RENNER.
4. How to Use and Maintain the Range—How to Face the Future. DONALD F. HERVEY.

V. Botanists' Dinner and Vice-Presidential Address of Section G. *Dec. 30.* LINCOLN CONSTANCE. **The Role of Plant Ecology in Biosystematics.**

VI. Symposium: **Plant Sociology and the Taxonomy of Vegetational Units.** Joint program of AAAS Section G and the Ecological Society of America. *Dec. 30.*
1. Introduction: Concerning a Potential Proposal to the Next International Botanical Congress on a Code for Nomenclature of Vegetational Units. STANLEY A. CAIN.
2. The Need for a Taxonomy of Plant Communities. HENRY S. CONARD.
3. Some Problems Presented by European Phytosociological Systems. H. H. BARTLETT.
4. Philosophical and Practical Considerations of the Braun-Blanquet System of Phytosociology. FRANK EGLER.
5. *Aceretum sacchorophori* and the Phytosociological System. PIERRE DANSEREAU.

6. Forest Types, Associations and Their Classification: The Viewpoint of a Forest Ecologist. SAMUEL A. GRAHAM.
7. The California Redwood Forest. HERBERT L. MASON.
8. Comparison of Vegetation of Acid and Serpentine Soils in California. CALVIN McMILLAN.
9. The Continuum. JOHN T. CURTIS.
10. Conclusions. STANLEY A. CAIN.

VII. There will be sessions for contributed papers in the botanical sciences, *Dec. 27-30.*

OTHER PROGRAMS OF INTEREST TO BIOLOGISTS

SOCIETY FOR INDUSTRIAL MICROBIOLOGY

This society will meet with Section P. Sessions are planned for contributed papers and a symposium, **Industrial Microbiology,** will be sponsored.

AMERICAN PHYSIOLOGICAL SOCIETY AND THE SURVEY OF PHYSIOLOGICAL SCIENCE

Symposium: **Education in Physiological Science,** *Dec. 28, aft. and eve.*

1. Introduction. ORR E. REYNOLDS.
2. Undergraduate Courses in Physiology Offered in U. S. Colleges and Universities. E. G. STANLEY BAKER.
3. Physiological Content of Elementary Biology Courses. JULIAN SOLINGER.
4. Physiology in Botanical Education. DAVID R. GODDARD.
5. Physiology in Zoological Education. C. LADD PROSSER.
6. Professional Education in Physiology. RALPH W. GERARD.
7. Physiology in Medical Education. JULIUS H. COMROE.
8. Physiology in Engineering Education. CRAIG TAYLOR.
9. Physiological Science in Public Education. MAURICE B. VISSCHER.

AAAS AS A WHOLE

General Symposium: **The Nation's Nutrition—From Soil to Cytoplasm,** *Dec. 30.*

Part I. **Sources of Food.** HOWARD B. LEWIS, Presiding.

1. Soils and Their Relation to Food Production. LLOYD M. TURK.
2. Foods of Plant Origin. GEORGE R. COWGILL.
3. The Production of Foods of Animal Origin. ROY C. NEWTON.
4. The Deterioration of Food and Food Stuffs. E. C. STAKMAN.

Part II. **Assimilation of Food.** EDWARD A. DOISY, SR., Presiding.

1. General Biochemistry and Health Relationships of Nutrition. C. GLEN KING.
2. Protein Requirements of the Diet. JAMES B. ALLISON.
3. Fats and Carbohydrates in the Diet. HARRY J. DEUEL, JR.
4. Vitamins and Minerals. CONRAD A. ELVEHJEM.

The AAAS Annual Exposition of Science and Industry and the AAAS Science Theatre will again be prominent features of the meetings. **Coupons for hotel reservations and advance registration will be found in *Science* and *The Scientific Monthly*.**

The

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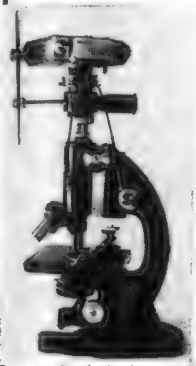

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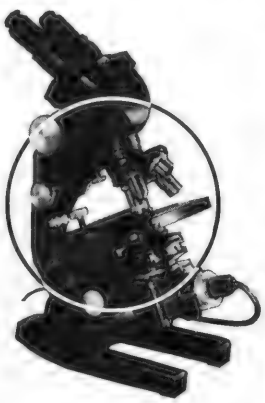

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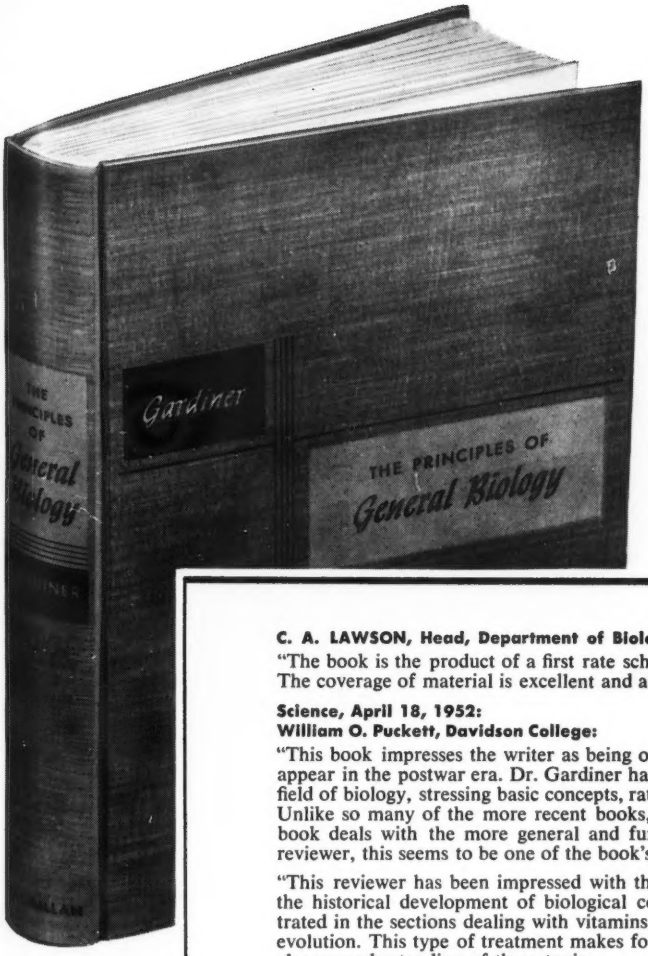

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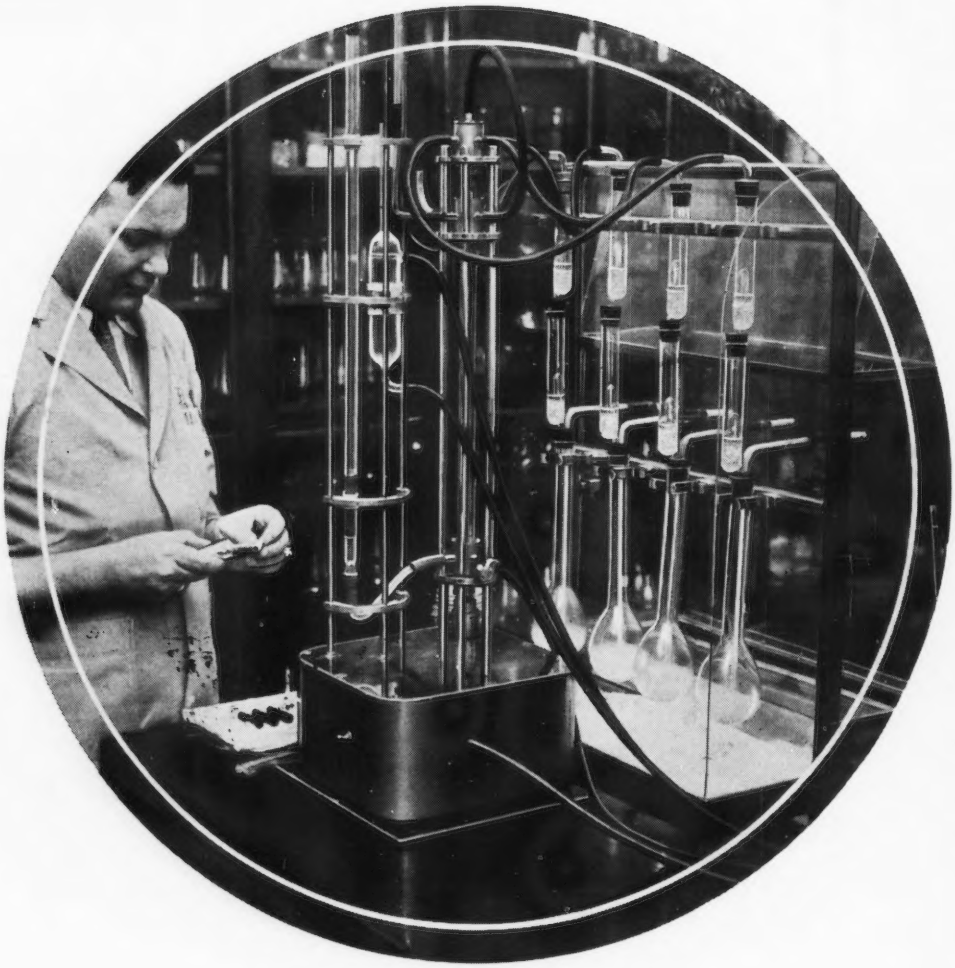

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